ANALYSIS OF THE SCHOOL PREFERRED READING PROGRAM IN SELECTED LOS ANGELES MINORITY SCHOOLS

PREPARED FOR THE LOS ANGELES UNIFIED SCHOOL DISTRICT

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WITH CONTRIBUTIONS BY
GERALD SUMNER AND
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PREFACE

The Board of Education of the Los Angeles Unified School District voted in mid-1975 to contract with an outside group to study gains in 6th grade reading achievement in selected elementary schools with predominantly minority populations. The impetus for the study was the installation of the School Preferred Reading Program in 1972. In January 1976 the board awarded a contract to Rand, calling for an analysis of the program's effects on reading progress for Black and Mexican American students.

SUMMARY

Increasing students' reading achievement, particularly among minority students, has long been a central concern of the Los Angeles Unified School District. To further that goal, the LAUSD instituted its School Preferred Reading Program in 1972. In 1975, it contracted with The Rand Corporation to conduct the present study, whose purpose is to identify the school and classroom policies and other factors that have been most successful in raising the reading scores of inner-city children.

We selected a sample of 20 elementary schools for analysis. All displayed large or consistent gains (in percentile points on national norms) for the 6th grade on the CTBS reading examination between 1972 and 1975, had predominantly minority-group student bodies (about half were mostly Mexican American, the other half mostly Black), were located in low-income neighborhoods, and had 1975 enrollments of at least 400 students.

All principals and reading specialists present in 1976 were personally interviewed, and a questionnaire was administered to 81 of 83 teachers who taught 6th grade in these schools in 1974 and 1975. The purpose was to gather information on school leadership, reading program content and implementation, classroom atmosphere, and teacher attributes.

Background and demographic information, and reading test scores (from grades 3 through 6), were recorded for individual members of the 6th grade classes of 1974 and 1975 in 32 district junior high schools. The students' 6th grade classroom and school experiences, as identified in the elementary school data collection, were linked to their test scores and background information to construct a longitudinal file. Students for whom it proved possible to collect such data were found to be amply representative of students who graduated from the 20 schools in the sample in 1974 and 1975. Our analyses were conducted on these longitudinal files, not on comparisons of scores of successive 6th grade classes in a given school—the method the district typically uses to measure reading progress. The latter can easily be distorted by changes in student body characteristics from one year to the next. Although the schools in our sample gained appreciably in reading achievement between 1974 and 1975, the *average 1975 6th grader* in our sample declined slightly on national norms from his or her 5th grade rank.

The tests used by the district were found to be reliable, as technically defined, according to standards of internal consistency and parallel form. High reliability was found not only for the sample as a whole but for individual schools.

The validity of a few of the reading gains registered in sample 6th grade classrooms was thrown into doubt by interview reports of test exposure. These reports were matched by patterns of unusually high gains for large fractions of students in these same classrooms (a total of six out of 78). The data from these classrooms were excluded from the analysis. In four additional classrooms, gains were as large and as concentrated, but we received no field reports of excessive test preparation. We performed our analysis with these four classrooms included, and then repeated it after deleting them, to measure the sensitivity of our results to varying judgments as to the extent of test exposure.

Background factors (such as socioeconomic status, health, ethnicity, and attendance) and reading test scores in earlier grades were found to account for the largest part of the variation in 6th grade reading scores for the children in our sample. For both Black and Mexican American children, however, other variables reflecting particular school and classroom experiences also had a significant influence. In contrast to some previous research, we found that the school, the teacher, and combinations of school and teacher *did* make a difference in explaining measured reading proficiency. We also found that principals in both ethnic subsamples were able, with surprising accuracy, to identify and rank teachers in their schools by the teachers' ability to bring about reading progress (as measured by data on individual student gains, which were not available to the principals when they assessed the teachers).

In analyzing specific factors associated with observed gains in reading performance, we obtained strong results only for the sample of Black students. For them, the following factors were significant:

- Teacher training in the use of a variety of materials keyed to individual student needs
- Teachers who felt efficacious
- Maintenance of orderly classrooms
- High levels of parent-teacher contact
- Teacher flexibility in modifying and adapting instructional approaches
- Frequent informal consultations among teachers in implementing reading programs

The first three factors were significant even when our analysis excluded all classrooms in which the validity of test outcomes was uncertain. Confidence in the findings with respect to the last three factors was lessened, however, when we adopted this maximally skeptical procedure.

We also conducted a supplementary study—largely subjective, because of limited resources—of community involvement in the schools. We concluded that, in Black neighborhoods, the more vigorous were the schools' efforts to involve parents and community in school decisionmaking, the better did 6th grade students in those schools fare in reading attainment.

Factors not associated statistically with the reading gains of Black children included specific reading program or system, reading strategy (e.g., phonics versus comprehension), and such teacher attributes as ethnicity, experience, and type of education.

Our inability to identify specific factors associated with the reading gains of Mexican American students—which in fact were almost identical overall to the gains registered by Black students—was probably due to failure to include or accurately measure some key variables. For example, we had no data on variations in English fluency across the sample of Mexican American children.

Our findings support the continuation of the LAUSD's School Preferred Reading Program, which features school autonomy and teacher flexibility. Because principals seem able to identify effective practices, because teachers need the freedom to adapt and the training for individualization, and because no prefabricated reading system or strategy can provide a "quick fix" to the complex problem of reading instruction, a good measure of decisionmaking authority at the local school level seems warranted.

ACKNOWLEDGMENTS

We wish to extend our grateful thanks to the many people who contributed to this study.

Among the officials of the Los Angeles Unified School District, we particularly note the gracious cooperation at every phase extended by Dr. William Johnston, Superintendent, and his staff, notably Dr. James Taylor, Deputy Superintendent, Mr. William Rivera, Special Assistant to the Superintendent, Dr. John Wright, Director, Research and Evaluation Branch, and Mr. Robert Sallander, Assistant, Research and Evaluation Branch. Particularly helpful were Dr. Harry Handler, Associate Superintendent, Instruction, and Mr. Walter Lansu, Administrator, Reading Support Services Center, our project monitor, without whose constant and perceptive assistance we could not have completed our assignment.

Our thanks go equally to the principals, teachers, and specialists in the 20 elementary schools that formed our sample. (See App. A for a list of these schools.) The study would not have been possible without their hospitality and their cooperation in the interviews and surveys we conducted. We gathered data from student records in 32 of the district's junior high schools (see App. A); junior high school principals, counselors, and clerks generously granted us access and assistance in using these files.

Many representatives of community groups concerned with education provided guidance for this study. Special thanks go to Rev. Vahac Mardirosian of the Hispanic Urban Center, Mrs. Ruby Aguilar of the Mexican American Education Commission, Mr. Walter Jones of the Black Education Commission, and Mrs. Nancy Oda of the Asian American Education Commission.

Rand coders, working under Deborah Hensler, Associate Head, Social Science Department, and Jennifer Hawes, Survey Analyst Assistant, were an integral and effective part of our study team. Keypunchers and data file specialists supervised by Don Trees, Manager, Survey Data Preparation, performed a vital function. Millicent Cox was the study team member who oversaw this phase of our activities. Computer programmers who assisted on the project were Bryant Mori, Dolph Hatch, Kathleen Scofield, and Robert Young. Our thanks go to them for the dispatch and precision with which they worked.

Lorraine McDonnell, Velma Montoya Thompson, and Jay Sumner conducted interviews and surveys at the schools, while Patricia Conry-Oseguera and Nicelma King interviewed parents and community representatives. Gail Zellman directed this work.

David Armor with Millicent Cox performed the reliability and validity analysis, which was a major aspect of our charge in this study.

Edward Pauly and Gail Zellman were responsible for the analysis of the school and classroom factors associated with reading achievement, our second major study task.

Anthony Pascal was overall director of the study.

Finally, we thank our Rand colleagues for their many helpful comments and suggestions. We especially note the contributions of John Pincus, Director of Rand's

Education and Human Resources Program, Dan Weiler, Deputy Director, and Stephen Carroll. Also very helpful were Robert Crain, Milbrey McLaughlin, Roger Rasmussen, and John Rolph. Paul Berman of Rand and Richard Murnane of the University of Pennsylvania (a Rand consultant) contributed incisive and helpful reviews of our work and had major roles in the conceptualization of the study.

CONTENTS

Chapter 1

INTRODUCTION

The impetus for this study arose as the Los Angeles Unified School District (LAUSD) was about to complete its third year under the School Preferred Reading Program. The program concentrated on elementary students who were scoring at the 25th percentile or lower on standardized reading tests, it featured determination of goals and approaches by individual schools, and it set minimum quantitative objectives for reading gains at the 3d and 6th grade levels. The first year of the program, 1972-73, emphasized diagnosis and program design; the following two years incorporated the devised reforms into ongoing school operations.

The purpose of the study was to identify those aspects of school reading programs that were associated with substantial and consistent gains in standardized reading test scores among minority children.

The terms of the contract award to Rand specified that the outcomes in reading achievement were to be gauged in terms of scores on standardized tests. Many analysts of the educational process—including some members of the Rand study team—have expressed doubts about the accuracy of such tests as indicators of students' educational progress, particularly for students from minority backgrounds. Because test scores are recognized and accepted by many others, however, we felt it important and worthwhile to try to discover which classroom approaches and which school policies were associated with increases in such scores.

As part of this effort we sought to determine whether the observed gains were valid and reliable, to identify school and program characteristics that accounted for the valid gains, and to provide advice on the applicability of successful programs to other schools and to future school operations.

Rand conceived this task as the identification of school and district policies that hold the most promise for improving reading achievement in minority schools. Therefore, the study does not focus on the teacher-student interactions that are often the basis for "process" analyses of education, such as how directive teachers are, how clear their presentations are, how frequently they ask questions, or how they reward students for good work. Instead, our analysis concentrates on how policy variables—for example, the content of schools' reading programs, the ways the programs are implemented, and support from principals—are associated with gains and losses in achievement test scores. These kinds of variables are only a part of what matters in the schooling process, but we believe they represent the bulk of the factors that can be directly measured and influenced by people involved in school policy decisions: administrators, teacher groups, and parents. Consequently, our policy analysis seeks to identify those reading programs and school and classroom environmental factors that can be most readily altered to improve students' reading skills.

RESEARCH APPROACH

We became convinced early in the study that the criterion of improvement must be the gains in reading achievement over time *for a given group of students* as they progress from grade to grade. Year-to-year gains at a *fixed grade level*, the criterion often used, can be misleading: successive cohorts of students in that grade may differ sharply—in previous reading achievement and socioeconomic status, for example—and hence distort the true picture of gains, particularly in areas with high inter-school mobility.

To determine which reading approach or other educational factors are reliably related to reading gains, we considered a large number of hypothetical factors and assessed each one's likely influence on reading achievement. For us to do so, the schools in our sample had to vary in reading outcomes. Fortunately, they did. Otherwise—if all the schools had scored about the same—there would be no way of judging the relative success of the different approaches to reading adopted by individual schools and teachers.

CONDUCT OF THE STUDY

Our first task was to select the 20 elementary schools that would constitute our sample. This selection was performed in conjunction with LAUSD staff and with the assistance of community groups. The schools chosen had to demonstrate: substantial or consistent test score gains across 6th grade classes between Spring 1972 and Fall 1975;[1] enrollment of at least 400 students, with minority children making up at least 80 percent of the student body by Fall 1975; a balanced distribution among schools with predominantly Black and predominantly Mexican American enrollments; and a ranking in the lowest 200 (out of 436 total) on Title I criteria (which are based essentially on the socioeconomic status of students). Appendix A describes those criteria in more detail, and lists the names of the 20 schools and their characteristics as compared with other schools in the system.

Thus, as would be expected, our sample schools have a higher percentage of minority students,[2] larger enrollments, lower socioeconomic rankings, and larger gains in reading test scores in successive 6th grade classes than do the aggregate of elementary schools in LAUSD. They started much lower than all other schools on 6th grade reading scores (measured in percentiles on national norms) in 1972 and had registered much larger percentage gains by 1975. These schools also had a starting point slightly lower than the average 80 percent minority school in the district; their gains by 1975 were proportionately larger than those in other minority schools.

Test score data on individual students in the 6th grade classes of 1974 and 1975 from the 20 sample schools, and other information on the students' ethnic and family background, health problems, and elementary school attendance patterns, were collected in the 32 junior high schools where the student cumulative records

[1] A substantial gain was defined as an increase of at least 15 percentile points on the national norms for the McGraw-Hill Comprehensive Test of Basic Skills (Form Q-2); a consistent gain meant that no single year's increase exceeded two-thirds of the total gain.

[2] Of Black and Mexican American students, that is. The sample schools have a lower proportion of Asian and Native American students than does the system as a whole.

are now located. Thus we were able to retrieve information on reading scores for grades 3 through 5 for these same students, making it possible to study their reading progress over time, which we believed necessary for reasons discussed earlier. No student names have been retained in our files. Students were traced to their traditional receiving junior highs and also to schools they attended through the Permits with Transportation program.

We were able to collect longitudinal data (i.e., data for individual students over a four-year period) for 74 percent of the graduating class of 1974 and 81 percent of the graduating class of 1975. For none of the 20 schools did we find data on less than 68 percent of the students. By comparing the mean raw score (CTBS-Q2) for *all* test-takers in the 20 schools with the same figure for all students for whom cumulative records were located, we were able to ascertain that our complete data sample was highly representative of the student population of test-takers in each of the 20 schools. Data collection procedures, response rates, and the possibility of sample bias are discussed in detail in App. A.

Information on school atmosphere, management and administration, teacher characteristics, and approaches to reading instruction were collected by means of personal interviews or self-administered questionnaires among the faculty and administrators of the 20 elementary schools. In three of the schools, intensive case studies were conducted that permitted us to characterize differences in reading programs and to investigate how school settings affect reading instruction. This information contributed to the construction of questionnaires adminstered in all the schools to teachers, principals, and reading coordinators, or their equivalents. The survey data were then transformed into quantitative factors designed to describe teacher characteristics, classroom approaches to reading, implementation methods, classroom atmosphere, emphasis on test-taking skills, training received, teacher's use of resources, and parent contacts. At the school level we attempted to measure principals' support and implementation activities, use of management systems, and the accuracy with which principals are able to identify faculty who are effective reading teachers.

Chapter 2 uses the data collected to perform an analysis of the reliability and validity of observed reading scores, our first analytical task. Chapter 2 also presents the model we employed to examine the reliability of test scores and conceptualize valid gains, and we comment on the possible effects of "test emphasis" in some classrooms on the validity of test score results.

Chapter 3 treats the influence of school, classroom, and programmatic factors on reading achievement, the subject of our second analytic task. We identify factors that our analysis indicates did in fact influence reading achievement, such as student body composition, program and implementation factors at the school and classroom level, and the activities of teachers and parents. Quantitative findings on the influence of each factor on reading achievement are discussed.

Chapter 4 summarizes several of the positive factors found in our statistical analysis and illustrates what they look like in practice, the intent being to lend aid to principals and teachers seeking to improve their own schools' reading programs.

Chapter 5 covers the results of our interviews with parent and community group members, our final analytic task. It treats our assessment of the degree to which parents and community representatives were involved in school affairs, their roles in school decisionmaking, and their possible relationship to reading progress.

Chapter 6 presents our conclusions and recommendations. We summarize our findings and comment on their applicability to future programs in the 20 schools and to other schools in the LAUSD. Since we analyzed data from a nonrandom sample of schools, the generalizations from our findings are not *unambiguously* applicable to the population from which this sample was derived; it is at least possible that the schools in our sample share some characteristics that systematically differentiate them from all other LAUSD schools or even from the population of LAUSD minority schools. Since we, the LAUSD, and the public are interested in the generalization of lessons learned in this study to other schools and other times, the reader is cautioned that our policy recommendations contain a substantial judgmental component. Our judgments are based on our experience with other schools and other school systems, the knowledge of practitioners, participants, and observers we talked with, our understanding of current district practices, and our acquaintance with the process of implementing educational innovations.

Chapter 2

RELIABILITY AND VALIDITY OF READING GAINS

All 20 schools show varying gains in 6th grade reading achievement from 1972 to 1975, some of them dramatic. While our ultimate goal is to identify school, classroom, and reading program factors that may be responsible for these gains, several preliminary issues must be settled before this substantive analysis can proceed. First, we must establish whether the tests used by the district are *reliable* for these predominantly minority schools, as compared with the reliability standards reported by the test publishers. Second, we must determine whether the gains are *valid;* that is to say, whether they reflect real gains in achievement by students who have experienced the reading programs in these schools. Finally, if any gains are found to be unreliable or invalid, we must develop a procedure for identifying reliable and valid gains to be used in the subsequent investigation of school and classroom factors.

In addressing these issues, we will use data from both the student cumulative records and the teacher surveys. Data available from student cumulative records include results for several different reading achievement tests and subtests over the three years since the reading program began, some of which were administered concurrently. These data can be used to explore a number of reliability and validity problems, including the true gains for groups of students over time. In addition, the teacher surveys included an open-ended question concerning the teachers' own opinions about the validity of gains shown by their schools. Their answers were useful for judging that validity.

RELIABILITY

All standardized test scores contain some amount of unsystematic, random error that is unrelated to a student's true ability. Test reliability assesses the degree of random error found in a given test instrument; it is measured by reliability coefficients whose values range on a scale from 0 to 1. Generally speaking, a test is considered reliable if its reliability coefficients equal or exceed 0.90. A test with a reliability much below 0.90 contains a fairly high degree of random error, and may be deemed unsuitable for investigating the causes of reading gains.

To be sure, the standardized tests selected by the LAUSD and the State of California have demonstrable reliability coefficients exceeding 0.90, and in fact the reading tests most widely used in the district—the Comprehensive Test of Basic Skills (CTBS), forms R, Q, and S—all have reliabilities of 0.95 or above. However, the basis for these published reliabilities consists of national norming studies that use predominantly white or Anglo populations; separate coefficients for minority populations are seldom available. Given the frequent concern that tests for Anglo populations may not be reliable for minority populations, it is prudent to establish reliability levels for our specific sample of predominantly Black and Mexican American schools.

Using data derived from student cumulative records, we can investigate two specific types of reliability. First, internal consistency reliability can be established by using the correlation between the verbal and comprehension subtests available from the CTBS form Q2 administered to district 6th graders in the Spring of 1975. Second, we have a rare opportunity to assess parallel form reliability for the CTBS form Q2 and form S2, both of which were administered to all district schools during the Spring of 1975. Both types of reliability can be calculated for each school in our sample and compared with similar coefficients based on norming data published by the test developers (see CTBS, 1970, 1974).

Internal Consistency Reliability

Internal consistency reliability is usually estimated by using all individual test items and applying a formula such as KR-20 (Guilford, 1954). By such a procedure the CTBS publisher reports reliabilities of 0.95 for the Q2 and R2 reading tests and 0.96 for the S2. Unfortunately, individual item scores are not available for the district data, so we must adopt another method. Since the CTBS reading test is composed of two subtests, vocabulary and reading comprehension, both of whose scores are available from the cumulative record, an alternative method is to apply the Spearman-Brown formula to the subtest correlation (Guilford, 1954). The Spearman-Brown formula gives the reliability for a test as $\rho = 2r/(1+r)$, where r is the correlation between any two subtest scores whose sum constitutes the total test score. The subtest correlation reported by the test publisher is 0.82 for the CTBS Q2 given to 6th graders, which yields a Spearman-Brown reliability of 0.90 for the total test

Table 2.1 lists the subtest correlations for each of the 20 schools; correlation for the total sample is 0.80 with an associated reliability of 0.89, which is nearly identical to the test norm. Further, the correlations and reliabilities for each school cluster fairly tightly around this value. Given a population correlation of 0.82, correlations computed from sample sizes around 80 (a conservative average for these schools) yields a 90 percent confidence interval between 0.75 and 0.87, which means that we would expect 90 percent of the sample values to fall in this range over repeated samplings. Indeed, we see that the correlations for all but two schools, or 90 percent of the sample, fall within this range. The two exceptions are Eastman with a correlation of 0.74, and Ascot with a correlation of 0.71. In general, the levels of internal consistency reliability are high and compare favorably with the results from test norms.

Parallel Form Reliability

Another method for estimating reliability relies on the existence of parallel forms, which in this case means reading tests that cover identical subject areas but whose individual item content differs. The correlation between two parallel forms is the reliability of either form. Forms R and Q of the CTBS reading test were designed as parallel forms. Form S is a newer version and is not strictly a parallel form for Q or R, since it covers some slightly different content. Nonetheless, test norms show a correlation of 0.93 between S and Q reading at 6th grade, which actually exceeds the parallel form correlation of 0.89 between R and Q.

In the Spring of 1975 all district 6th grades were given both the Q2 and the S2

Table 2.1

INTERNAL CONSISTENCY RELIABILITIES FOR 6TH GRADERS TAKING THE CTBS Q2 IN 1975

School	Correlation Between Vocabulary and Comprehension Subtests	Reliability[a]	(N)
Alta Loma	0.80	0.89	(80)
Angeles Mesa	0.77	0.87	(75)
Ascot	0.71	0.83	(85)
Dacotah	0.82	0.90	(67)
Eastman	0.74	0.85	(110)
Ford	0.75	0.86	(62)
Harrison	0.86	0.92	(52)
Hillside	0.78	0.87	(44)
Manhattan	0.76	0.86	(78)
Miller	0.86	0.92	(74)
118th Street	0.87	0.93	(62)
112th Street	0.87	0.93	(50)
Pacoima	0.78	0.88	(106)
Rosemont	0.81	0.90	(87)
Rowan	0.79	0.88	(28)
McKinley	0.75	0.86	(39)
Sierra Park	0.83	0.91	(129)
10th Street	0.80	0.89	(61)
28th Street	0.86	0.92	(86)
Vermont	0.83	0 91	(64)
Total sample	0.80	0.89	(1440)
Test norms	0.82	0.90[b]	

[a]From the Spearman-Brown formula $\rho = 2r/(1+r)$, where r is the subtest correlation.

[b]The internal consistency coefficient given by the publisher, based on all individual test items, is 0.95 (using KR 20).

reading tests, the scores for which are available in the cumulative records. Table 2.2 shows the correlation between the Q2 and S2 reading scores for students who took both tests (which includes about 90 percent of our total sample). For the sample as a whole the Q2-S2 correlation is 0.90, which compares favorably with the norm value of 0.93. Again, the reliabilities for individual schools are high, although a number of schools fall outside the 90 percent confidence interval of 0.89 to 0.95 (assuming an average sample size of about 65 students). Nonetheless, all of these correlations but one (Manhattan's 0.82) establish a high degree of school-level reliability for both the S2 and Q2 versions of the CTBS reading tests.

Summary

These results offer solid evidence that the reading tests used by the district in these minority schools meet the reliability standards determined by the test publisher in its national norming studies. Not only are the reliabilities high, nearing or exceeding 0.90, but two different methods of determining reliability yield nearly

Table 2.2

PARALLEL FORM RELIABILITY FOR 6TH GRADERS TAKING THE CTBS Q2 AND S2 READING TEST IN 1975

School	Correlation Between Q2 and S2 Reading Scores	(N)
Alta Loma	0.88	(63)
Angeles Mesa	0.86	(72)
Ascot	0.91	(78)
Dacotah	0.89	(64)
Eastman	0.88	(110)
Ford	0.92	(53)
Harrison	0.90	(50)
Hillside	0.92	(44)
Manhattan	0.82	(72)
Miller	0.86	(70)
118th Street	(a)	(a)
112th Street	0.91	(49)
Pacoima	0.93	(97)
Rosemont	0.89	(86)
Rowan	0.94	(20)
McKinley	0.92	(20)
Sierra Park	0.90	(126)
10th Street	0.87	(58)
28th Street	0.88	(80)
Vermont	0.92	(55)
Total sample	0.90	(1272)
Test norms	0.93	

NOTE: The S and Q are not strictly parallel, but the norm correlation for S and Q resembles the parallel form correlation for R and Q.

[a]Data for form S is not available in our file.

identical results. Even more important, high reliabilities are also shown on a school-by-school basis.

In concluding that the tests are reliable, however, we are not yet claiming that the test results in these 20 schools reflect true reading gains. Reliability coefficients assess random, unsystematic errors or inaccuracies, but not *systematic* biases. In other words, reliability coefficients reflect the consistency of results, not necessarily their truthfulness. The presence or degree of systematic bias is determined by a validity analysis.

VALIDITY OF GAINS

While there are many aspects of test validity, we are concerned here with only one; namely, whether the changes in successive 6th grade reading test scores reflect

real gains in reading achievement by the students in these schools. We do not attempt to assess the validity of the standardized tests themselves; such investigation is outside the scope of our study. Rather, we *assume* that the CTBS reading test, properly administered and scored, is a valid measure of English reading skills for the purpose of comparing one minority student (or school) with another.

Even with this assumption, however, there are still two sources of potential invalidity for reading gains. First, although it is true that all schools in our sample show increasing 6th grade scores from 1972 to 1975, these apparent increases derive from comparing different groups of students—that is, different 6th grades from one year to the next. Such gains owe partly to differences in the ability and composition of the successive 6th grade groups. For example, the 1975 6th graders at a school may have scored higher than the 1974 6th graders merely because they were higher-achieving students to start with. To assess true change, we must compare the performance of the same group of students between, say, 1974 and 1975 as they passed through the 5th and 6th grades.

A second possible source of bias is test exposure. It is a fundamental assumption of standardized achievement testing that students are not exposed beforehand to the test or to specific test content. The justifiable desire to familiarize minority children with standardized testing procedures has led to special test preparation exercises, including use of "practice" tests similar in format—but not content—to the CTBS. Such exercises are both legitimate and often necessary. However, any exposure of students to the official test or to a word list taken from the specific CTBS form would invalidate all or part of the test results. Any resulting gains would be real in the sense that scores would change, and they might also be reliable (if exposure occurred for both parts of a test or for both parallel forms). But such gains would be invalid since in all likelihood they would consist mostly of temporary changes induced by knowledge of the correct answers rather than an increase in reading skills. When test exposure occurs, the gains in reading scores are likely to be both sudden and very large. Since we observed such gains at certain schools, we undertook a separate analysis to assess this potential source of invalidity on a classroom-by-classroom basis.

Change in Reading Achievement

The first issue our validity analysis must settle is whether gains in 6th grade reading scores reflect improved reading ability. To do so we must compare test scores for a given cohort of students as it progresses through the elementary grades—for example, their scores from grades 3 through 6 for the 6th grade class of 1975, retrieved from the cumulative record. Students from the 6th grade class of 1975 who remained in a Title I school from 1972 to 1975 had a 6th grade Q2 reading score in the Spring of 1975, a 5th grade R2 score in 1974, a 4th grade R2 score in 1973, and a 3d grade score from the Cooperative Primary test in 1972. Since the R and Q are parallel forms normed in the same year, we can use them to assess changes in the same cohort or group of students from grade 4 to 6. It is more difficult to assess change from grade 3 because the Cooperative Primary is not parallel to the CTBS series, so test differences may not be valid indications of change.

Before turning to an empirical analysis of reading gains, we must raise a practical problem regarding the meaning of change on a standardized reading test such as the CTBS. Basically, there are two ways to assess change. First, gains in reading

knowledge can be assessed by comparing the *raw* scores from one year to another on the same form (or equivalent forms) of a given test. Obviously, such raw gain scores have meaning only for a particlar test, since tests vary in numbers of questions, time instructions, content, and so forth. But from a policy standpoint, a more important limitation is that raw gains do not tell us whether a program affects reading ability *over and above* what would be expected from typical students in any school. The reason is that nearly all schoolchildren show raw gains in reading from year to year, regardless of their school or program. Consequently, we must use some type of standardized score to determine whether a special program has affected minority reading skills beyond what would be expected of average children without the program.

The second way to assess change is to make comparisons between standardized scores such as percentiles. A percentile score—the measure used most widely by the district and the state—relates a student's standing to a national norm. For example, a student scoring at the 50th percentile has a raw score in the middle of the distribution, with half the students in the national norming sample scoring higher and half scoring lower. To remain at the 50th percentile in succeeding grades, a student has to gain about 10 raw score points a year, since the national norming sample for the CTBS shows this amount of gain in successive grade levels. One difficulty in interpreting percentile scores, then, is that equal percentile scores mask absolute gains in reading skills. A further problem with percentile scores for this study is that the national norm is determined by a predominantly Anglo population, and it is generally known that, nationally, minority populations score lower on standardized tests than Anglo populations. It might be fairly argued that the minority students in these schools should be compared with a national norm for minorities; unfortunately, separate norms for Anglo and minority populations are seldom available from test publishers.

To counteract these various difficulties we present our change analysis in both raw score and percentile score forms.

Total Sample Change. Table 2.3 shows the change in reading achievement from grade 3 to 6 for our sample of 1975 6th graders. The change for the total cohort appears in the top half of the table, using all students with at least one reported score in a given grade level, while the bottom half shows the change for a longitudinal sample of those students who have reported test scores in all four grades.

The essential point to be seen from Table 2.3 is that while all the schools in our sample show successive gains in average 6th grade percentile scores from 1972 to 1975, the same cohort of students shows a slightly declining trend in percentile scores from grade 4 to 6. In other words, for the sample as a whole, successive 6th grade percentile changes should not be used to conclude that a given group of students actually improved in reading achievement *percentiles* over this period.

Table 2.3 also illustrates the problem of comparing the Cooperative Primary with the CTBS. Note that an increase from the 23d percentile in the 3d grade to the 31st percentile in the 4th grade is contradicted by the slight declining trend from the 4th to the 6th grade. Since it makes little sense that the reading program should have a positive effect in the first year but not in later years, it is more likely that Cooperative Primary scores are not directly comparable to the CTBS series.

We emphasize that the declining percentiles in Table 2.3 do not mean that students are not learning to read better. On the contrary, changes in the raw score

Table 2.3

COHORT AND LONGITUDINAL CHANGES IN READING SCORES FOR THE TOTAL SAMPLE

Cohort	1972: Grade 3 Coop Primary	1973: Grade 4 CTBS R2[a]	1974: Grade 5 CTBS R2	1975: Grade 6 CTBS Q2
Cohort of all 1975 6th graders				
Percentile	23%	31%	28%	26%
Raw mean[b]	29.5	29.7	38.6	54.3
(N)	(1364)	(1287)	(1207)	(1502)
Longitudinal panel				
Percentile	25%	33%	30%	29%
Raw mean	29.7	30.3	39.9	55.7
(N)		(759)		

[a]Raw mean excludes Manhattan, Rosemont, and Sierra Park—which gave the Q2 in 1973—but the percentile includes all the schools.

[b]The maximum reading score is 85.

means from 4th to 6th grade—9 points from grade 4 to 5, and 16 points from grade 5 to 6—show clearly that students are advancing in absolute terms. But since students in the national norming sample show slightly higher gains over these grade levels on the same tests, the result is a slightly declining percentile trend for our sample. The national norms show a gain of 12 raw points from grade 4 to 5 (for students at the 33d percentile in 4th grade) and a gain of 18 points from 5th grade R2 to 6th grade Q2 (for students at the 30th percentile on the 5th grade R2).

Not all students in the 1975 6th grade cohort took all the tests since 3d grade; that is the reason the number of cases differs from year to year in the third row of Table 2.3. Since we want to compare the *same* group of students over time, the bottom two rows of Table 2.3 show test results from a "longitudinal panel" of those students who have taken all the tests. Even though this panel is much smaller than the 1975 cohort (759 versus 1502), there is no significant bias. The panel has slightly higher ability than the entire cohort—about 2 percentile points—but the trend of decreasing percentile scores remains nearly identical.

School-by-School Changes. Table 2.4 shows the school-by-school changes in reading achievement from grade 4 to 6. We do not identify individual schools here because we pledged confidentiality to survey and interview respondents, and some of the information in this section is sensitive. We have scrambled the order of the schools (so their names are not in alphabetical order) and have arbitrarily assigned letters in place of names.

Although the 20 schools were chosen because of percentile gains in successive 6th grade reading scores, the change analysis reveals that, for most schools, the 1975 6th grade class actually shows a decline in average percentile scores relative to its position in the 4th grade. In many cases the decline is slight; fairly large declines have occurred for schools F, G, H, and K. Six schools show positive gains, but some

Table 2.4

CHANGE IN READING ACHIEVEMENT BY SCHOOL

School	Percentile Scores			Net Change	Raw Score Means			(N)
	Grade 4	Grade 5	Grade 6		Grade 4[a]	Grade 5	Grade 6	
A	35	30	30	-5	39	41	57	(92)
B	22	18	23	+1	24	30	52	(40)
C	30	32	25	-6	29	42	53	(12)
D	26	25	20	-6	27	35	49	(55)
E	29	22	59	+30	28	34	70	(42)
F	50	41	32	-18	42	48	59	(29)
G	35	29	23	-12	32	40	52	(60)
H	42	34	30	-12	37	44	57	(50)
I	30	25	22	-8	29	37	51	(48)
J	34	33	32	-2	32	43	58	(46)
K	28	20	15	-13	28	32	43	(33)
L	25	18	31	+6	26	30	58	(54)
M	30	26	26	-4	29	37	54	(22)
N	29	30	28	-1	28	41	56	(30)
O	31	(b)	25	-6	37	(b)	52	(55)
P	43	38	36	-7	37	47	61	(70)
Q	29	40	32	+3	28	48	58	(33)
R	39	40	52	+13	42	48	67	(60)
S	32	32	30	-2	30	42	57	(39)
T	26	31	30	+4	27	42	57	(42)
Total	33	30	29	-4	30	40	56	(857)

[a]Schools A, O, and R have form Q2 scores in grade 4; all others are R2.

[b]No 5th grade scores available.

gains are slight and the pattern is not consistent over the three years. Large gains are shown by school Q from grade 4 to 5, while schools E, L, and R show large gains from grade 5 to 6. Clearly, comparing different groups of students in the same grade from one year to another does not constitute an assessment of the actual change or improvement experienced by the same group of students over time.

Another factor that may explain part of the difference between Table 2.4 scores and successive 6th grade scores is that the district used median percentile scores, while we assigned a percentile ranking to the raw mean for a given school. The difficulty with median percentile scores is they do not reflect changes in scores below or above the median value. Our analysis of the distribution of raw scores on a school-by-school basis showed that, indeed, there were many shifts of raw scores (either upward or downward) from one year to another that occurred entirely below (and sometimes entirely above) the median for both years. As a consequence the median might remain constant from year to year, or even increase slightly, in spite of serious declines in scores below the median. It is our conclusion that a comparison of raw score means, when converted to percentiles, more accurately summarizes the total change over time than do median percentile scores.

Table 2.4 also shows the changes in raw score means for each school. We emphasize that every school shows an increase in absolute reading scores in both years, meaning that reading skills are improving in all schools in our sample. However,

since the average student (at these levels) who takes the CTBS shows a gain of 12 raw points from grade 4 to 5 and 18 raw points from grade 5 to 6, most schools show net declines in their percentile scores.

While the change analysis shows declines in achievement percentiles for most schools, it is still possible that successive 6th grade changes are good *relative* indicators of the most effective or least effective schools. This can be tested by comparing the ranking of schools according to successive 6th grade percentile changes (see App. A) with a ranking based on Table 2.4. The rank order correlation is 0.65 for all 20 schools, which confirms a fairly good—although by no means perfect—relationship between successive 6th grade change and actual longitudinal change. But when we exclude three schools whose scores might be invalid for reasons given in the next section, the rank order correlation drops to 0.51. Clearly, although 6th grade differences from year to year are somewhat indicative of actual improvement, this validity correlation is not high enough to warrant substitution of successive 6th grade change for measures of actual change. In particular, for our analysis of the effects of reading program factors, we will want to use actual longitudinal changes in reading achievement as our main criterion.

Test Exposure

We found that a number of classrooms showed unusually large gains in average reading levels from grade 5 to 6. In an analysis of individual schools and classrooms, we found that some students—and sometimes an entire classroom—gained over 50 percentile points. Such changes are possible for individual students over an extended period, but it is exceedingly rare for special reading programs to cause such large shifts for large numbers of students in a one-year period. Therefore, when the distribution of these unusual gains tends to cluster in certain schools, or, more important, in certain classrooms, the possibility of prior test exposure—"teaching the test"—must be explored.

Most teachers familiar with standardized testing procedures recognize that test exposure invalidates test scores. Sometimes, however, the incentives to engage in overzealous test preparation may be so strong as to lead to test exposure. A number of teachers surveyed said they felt administration or principal pressure to raise test scores at their school. Moreover, many teachers are sensitive to the problems of measuring the ability level of minority children on standardized tests. When asked whether test scores accurately reflected their students' ability level, 20 out 81 of our sample teachers reported that scores presented a worse picture than really existed because of problems in test-taking. As a result of these concerns, most schools have initiated special tests or programs for improving children's effectiveness in taking standardized tests, such as creating a test awareness center in the classroom, instructing students in test-taking skills, providing practice with multiple choice tests, and orienting one's own tests to expose children to the mechanics of standardized tests. All these activities are entirely legitimate, appropriate, and often necessary.

But an emphasis on test-preparation that extends to drilling children on actual test questions, teaching the vocabulary words on the test, or exposing children to test materials prior to test day introduces a serious bias and invalidates test scores. Of course, not all test exposure is intentional; it may occur inadvertently if a teacher's vocabulary list for drill chances to have a high concentration of words from the various CTBS reading test forms. Unfortunately, we have evidence of intentional

test exposure in a few of our classrooms. Although it applies to only a small minority of the teachers in the study, their classrooms must be eliminated from the sample before we can proceed with an analysis of factors associated with valid reading gains.

Our evidence on test exposure takes two forms. First, and most critical, three respondents at two schools stated that reading gains at their scools were invalid because of test exposure. These two schools—and especially the six classrooms involved—showed unusually high proportions of students gaining more than 30 percentile points or so in the one year between the 5th and 6th grades.

Second, several other schools with high average gains showed a concentration and patterning of changes similar to those where exposure was claimed directly. These schools are characterized by an uneven distribution of change both within and between classrooms, frequently yielding a bimodal distribution wherein one group shows little or no change and another group shows extreme change. Although these changes cannot be definitely attributed to test exposure, the fact that exposure occurred in some high-gaining classrooms prompts us to raise questions about the validity of reading gains for all classrooms showing a high concentration of unusually high-gaining students.

Table 2.5 shows the uneven distribution and concentration of high-gaining students. A high-gainer is defined as a student gaining more than 3 deciles (or about 30 percentile points) in reading between grades 5 and 6. At the school level we note that the 143 high-gaining students are concentrated in five schools—B, E, L, R, and T, with percentages of 27, 73, 54, 36, and 17, respectively. The remaining schools have between 0 and 6 percent of these high-gainers. More important, the right-hand portion of the table shows an uneven distribution of these students within the schools. In schools B And T, for example, which have lower proportions of high-gainers than the other three, most are concentrated within 3 of the 8 classrooms. Altogether, 10 out of 78 classrooms have more than 30 percent of their students showing gains exceeding 3 deciles during the 6th grade.

Of those 10 classrooms, 6 were in schools where claims of test exposure were documented in the teacher survey. For the remaining 4 classrooms we have no definitive proof of test exposure, although we did gather certain other indirect evidence in addition to the observed concentration of unusually high-gainers. First, for three out of the four teachers who were present in the district during the previous school year, we found that none of their 6th grade students gained more than 30 percentile points during the 1973-74 school year; in fact, two classes showed a net decline in achievement percentiles (the other showed a slight increase of 3 percentile points). Thus, their large classroom gains in 1974-75 were inconsistent with their classroom gains the year before. Second, in one of these classrooms we found that two-thirds of the high-gainers had vocabulary gains exceeding 50 percentile points with only a few showing comparable gains in comprehension. It is possible, then, that their 6th grade vocabulary gains may be spurious, possibly because of test preparation practice on a word list taken in part from CTBS reading tests. Finally, three of these classrooms sent students to junior highs that administered 7th grade tests in the spring of 1976. Unfortunately, since tests are given only to randomly selected students in each class, only 3 of the 23 high gaining students had 7th grade reading test scores. But all 3 of these students showed precipitous drops in reading percentiles from grade 6 to 7 that matched their dramatic rise from grade 5 to 6 (20% to 79% to 7%; 29% to 72% to 21%; and 11% to 69% to 19%). The only

Table 2.5

NUMBER AND CONCENTRATION OF STUDENTS GAINING OVER THREE DECILES DURING THE 6TH GRADE

School	Number of High-Gaining Students	% of Total Enrollment	Number of Classrooms Having Indicated Percentage of High-Gainers			
			None	1-15%	15-30%	Over 30%
A	4	4	1	4		
B	14	27	2			2
C	0	0	6			
D	1	2	4			
E	36	73				4
F	2	5	3	1		
G	2	3	3	2		
H	0	0	4			
I	2	3	3	1		
J	2	4	3	1		
K	0	0	4			
L	37	54				1
M	0	0	2			
N	2	6	1	2		
O[a]	—	—	—	—		
P	4	5	3	2		
Q	1	3	2	1		
R	26	36	1		1	2
S	1	2	7	1		
T	9	17	2	1		1
Total	143	14	51	16	1	10

[a]No 5th grade scores.

credible explanation for such extraordinary shifts for these three students is that test exposure inflated (and hence invalidated) their 6th grade scores.

We conclude, therefore, that 6 of these 10 classrooms with high proportions of unusually high-gaining students almost certainly have invalid gains due to test exposure. In another 4 classrooms, the statistical patterns and inconsistency over three school years raise the distinct possibility of test exposure, although we have no conclusive proof that it occurred. While the proportion of classrooms where exposure may have occurred is small, ranging from 8 percent to at most 13, our analysis must nonetheless take into account these possible sources of invalid gains.

PROCEDURES FOR HANDLING INVALID GAINS

A meaningful assessment of characteristics of effective reading programs requires a reliable and valid criterion for reading gains. While we have shown that the reliability of the CTBS reading test is adequate, two problems hamper a correction for the possibility of invalid gains in 6th grade reading scores: (1) In 4 of the 10 classrooms in which unusually large gains occurred, we have no teacher reports of test exposure to confirm the statistical evidence. (2) Even teachers whose overzeal-

ous preparation exercises led to test exposure may *also* have used highly effective approaches to reading instruction. That is, the reading test results may be a mixture of exposure effects and educational effects. In fact, our analysis of the characteristics of those teachers whose students registered unusually large gains reveals that some of the teachers also scored high on various classroom variables we measured. It is possible, then, that correction for invalid gains tends to exclude unusually good teachers as well.

Faced with this dilemma, we have followed a procedure designed to reveal the power of school and classroom factors as a function of one's belief about the true role of test exposure in producing measured gains. The procedure is as follows. We first measure the effect of the various factors under the assumption that all gains were valid. Next, we exclude the results for the six classrooms where exposure reportedly occurred. Lastly, we exclude results for all 10 classrooms including the four with unusually large and inconsistent gains. As pointed out in Chap. 3, the power of the school and classroom factors in explaining measured gains declines as more groups of students are deleted. The reader's acceptance of our list of successful educational practices must therefore depend on the reader's belief about the extent of test exposure and how many of these classrooms produced invalid gains.

BIBLIOGRAPHY

Comprehensive Test of Basic Skills, Form S, Technical Bulletin #1, Monterey Park, California; McGraw-Hill, New York, 1974.

Comprehensive Test of Basic Skills, Technical Report (Forms R & D), Monterey Park, California; McGraw-Hill, New York, 1970.

Guilford, J. P., *Psychometric Methods*, McGraw-Hill, New York, 1954.

Chapter 3

INFLUENCE OF SCHOOL AND CLASSROOM FACTORS ON READING ACHIEVEMENT

School policy decisions that attempt to improve students' reading achievement are based on policymakers' beliefs about how reading can be most effectively taught. This chapter analyzes the experiences of our 20 sample schools to identify the most successful school and classroom factors in raising students' reading levels. It is intended to contribute to policymakers' information regarding effective instructional policies.

We attempt to answer two questions: First, what decision levels are most closely associated with increases in students' reading scores—district level, school level, or classroom level? This might be called "the management question," since if district management policies are to be effective, staff members who actually have "policy leverage" (in that their decisions can affect reading achievement) should also have the responsibility and the authority to use it. Our analysis of the management question concludes that much of a child's reading achievement depends on the particular school and classroom he or she attends.

The second question can be called the "school allocation question," because it deals with how each school allocates its resources and staff energies among the many policies that may influence reading achievement. This question can be stated as follows: What combinations of curriculum, program implementation strategies, and classroom atmosphere will promote the greatest reading achievement? It is apparent that principals and teachers in the district are already considering this question. Our analysis of the school allocation question is intended to provide additional information that principals and their staff members will find useful in the difficult choices they have to make. We have also analyzed the question of whether principals have enough accurate information about instruction in each classroom to identify strengths and weaknesses in their schools' instructional programs.

We conducted parallel analyses for Black and Mexican American students, because of the possibility that school and classroom experiences affect these two groups in different ways. By undertaking parallel studies of the effect of school and classroom factors on the reading achievement of Black and Mexican American students, we take into account the likelihood that the effectiveness of school factors depends on the specific needs of students, and on the schools' ability to deal with these needs.

To correct for the problems with the validity of the district's test scores raised by test exposure, we checked our results by comparing them for different sets of assumptions about the scores' validity. A few of our results are sensitive to these assumptions, and the effect of differing validity assumptions will be discussed.

THE MANAGEMENT QUESTION: WHICH POLICIES AFFECT READING ACHIEVEMENT?

The question of whether district policies, school-level decisions, approaches used by individual teachers, or various other factors determine the reading achievement of inner-city children is obviously of great importance to policymakers. Since the district will doubtlessly wish to allocate authority and responsibility commensurate with staff capacities to influence reading outcomes, we begin this chapter by examining whether reading results in our 20 schools were due to policies at the district, school, or classroom levels, or to individual and "background" factors beyond the reach of school policies.

The analysis was conducted for slightly more than one thousand students who were in the 1974-75 6th grade class in our 20 schools. (See App. A.) We analyzed the increase in reading achievement that occurred over the 6th grade year, using data from those students who took reading tests at the end of the 5th grade and again at the end of the 6th, who were enrolled in regular classrooms, and for whom 6th grade attendance data were available. We studied this group for two reasons. First, it was possible to collect data for them (primarily test scores, student background measures, and classroom attributes). Second, the 1974-75 school year was the second operational year of the School Preferred Reading Program and therefore offered a fairer test of its influence on reading than did the previous year.

As Chap. 2 amply demonstrates, students' reading achievement in our sample varies widely. Overall reading ability increased at all 20 schools—substantially at some schools, very little at others (see Table 2.4). It can be inferred that school district policies produced an environment in which substantial increases in reading achievement were possible, but these policies produced results that were far from uniform—not a surprising outcome for a large school district.[1] This wide diversity in reading achievement suggests that one needs to examine differences among schools and classrooms to answer the management question.

Our study considered three additional parts of the management question:

1. How important to a student's achievement is the particular school he or she attended, compared with other schools?
2. How important is the particular classroom to which he or she was assigned, compared with other classrooms?
3. How important is the student's particular classroom *within* a given school, compared with other classrooms in *that* school?[2]

Each of these questions considers one particular way in which the child's school might affect his or her achievement. It is apparent that any and all school effects

[1] It was technically impossible for us to determine the influence of district-wide policies on reading achievement. This is because we did not compare Los Angeles with other school districts on that basis. The amount of diversity we found, however, clearly confutes the hypothesis that district policies uniformly dominated reading outcomes. District policies may be a *necessary* condition for reading gains, but they are not *sufficient* to explain the diverse gains that were recorded.

[2] These questions were examined by testing a "baseline" hypothesis that a child's school and classroom *do not* explain differences in learning, and comparing it with the hypothesis that they have unique and identifiable effects on learning. (Table 3.1 presents results of these comparisons for Black and Mexican American children.) This analytical technique was first used to analyze students' school achievement in the research of Eric Hanushek (1970) and Richard J. Murnane (1975). We have relied on their work in the design and presentation of this section of our analysis.

are contingent on the capabilities and problems that each child brings to school: prior knowledge and skills, good or poor health, strong or weak motivation and interest, and the wide variety of family, peer, and community experiences that shape a child's life and orientation to school. The question we ask is: Given the limited time and techniques that the schools can use to help children learn, to what extent is children's reading achievement attributable to school and classroom factors, rather than to the important nonschool factors that have shaped students' educational performance before they even enter the classroom?

We know that policies affecting reading instruction vary among schools, and that within schools, teachers have different approaches to reading instruction. If particular school and classroom policies and approaches have varying effectiveness, the 6th grade reading scores of students with identical initial achievement levels and background characteristics, *but with different school and classroom experiences,* will differ in proportion to the influence of those experiences. The multivariate analysis we conducted permitted us to measure the strength of school and classroom factors while holding constant the effects of a student's sex, attendance at school, family background, ethnicity, and 5th grade reading achievement. (See Table 3.1. The table displays statistical tests of the size of the effects of school and classroom factors on reading, holding constant the effects of a student's background and initial achievement.)

As mentioned, we conducted parallel analyses for Black and Mexican American children. (All of the analyses reported in this chapter were likewise disaggregated for these two ethnic groups.) We did so because the structure of the analytic model may differ for children of different ethnicities. For example, we found that the two groups differed in the amount of variation in 6th grade reading achievement that was attributable to factors other than 6th grade school and classroom inputs. Such individual and background variables accounted for 57 percent of the variation for Black children and 64 percent for Mexican American children (see Table 3.1).

Such differences necessarily imply that school and classroom factors variously affect students with different backgrounds. In this situation (which may be due to uneven measurement accuracy for different groups, as well as actual learning differences) separate analysis was the most prudent course.[3]

We found that both school and classroom factors significantly affected the reading achievement of both Black and Mexican American 6th graders. This finding was not sensitive to whether some, all, or none of the classrooms where test exposure was

[3] Discussion of the effect of ethnic differences on model specification for education production function studies such as this one may be found in Hanushek (1970) and Boardman (1975).

The educational literature on the learning patterns of Mexican American students discusses several issues relevant to our findings here. First of all, the language abilities of Spanish-speaking children vary all along the continuum of Spanish-English bilingualism and various specific cultural and subcultural backgrounds. (P. A. Zirkel, "Spanish-Speaking Students and Standardized Tests," *Urban Review,* Vol. 5, No. 6, June 1972, pp. 32-40.) It therefore may be necessary to disaggregate a Mexican American sample such as ours into smaller subgroups based on English language ability, language spoken in the home, etc., before it is possible to determine precisely what factors contribute to improved reading achievement for these students.

A second point is that our dependent variable is based on tests that measure reading achievement in English, not reading achievement per se. A number of researchers have administered standardized reading achievement tests in both the original English forms and a Spanish translation to Spanish-speaking students and have found that the students scored higher on the Spanish version. This difference was strongest on subtests dealing with word meaning. (See ibid. for a summary of these studies.) Other researchers contend that standard-English to standard-Spanish translations are not enough to produce equivalent achievement tests. One must also be aware of cultural boundaries that restrict meaning within a language.

Table 3.1

HYPOTHESIS TESTS FOR SCHOOL AND CLASSROOM EFFECTS

	Black Children	Mexican American Children
(H_1) The school a child attends is significantly related to achievement. (Comparison of Eqs. 1 and 2)	$F_{(9,427)} = 10.66$ $p < 0.00001$	$F_{(11,534)} = 3.24$ $p < 0.0003$
(H_2) The classroom to which a child is assigned is significantly related to achievement. (Comparison of Eqs. 1 and 3)	$F_{(27,410)} = 7.75$ $p < 0.00001$	$F_{(37,508)} = 2.64$ $p < 0.00003$
(H_3) The particular classroom within a particular school to which a child is assigned is significantly related to achievement. (Comparison of Eqs. 2 and 3)	$F_{(18,419)} = 5.43$ $p < 0.0001$	$F_{(26,519)} = 2.01$ $p < 0.001$

Probability values (p values) show the probability of incorrectly rejecting the null hypothesis that H_1, H_2, or H_3 is false, respectively, for the samples of Black and Mexican American children.

	R^2 for Black Children	R^2 for Mexican American Children
Equation 1. Regression of 6th grade score on 5th grade score, sex, attendance, health problems, family status, father's occupation, mother's occupation, age, and whether additional services were received under remedial reading or gifted program.	0.57	0.64
Equation 2. Same as Eq. 1, adding dichotomous variables for school attended by each child.	0.65	0.67
Equation 3. Same as Eq. 1, adding dichotomous variables for classroom attended by each child.	0.71	0.71

NOTE: Classrooms with fewer than five Black or Mexican American children for whom complete data were available have been excluded from the analysis of that ethnic group.

suspected were excluded. Growth in reading achievement depended on the school and classroom to which the child was assigned. Stated differently, if one wants to predict a child's achievement at the end of a school year, and one already knows the child's achievement level at the beginning of the year and has data on the child's background, it is still extremely important to know which school and classroom the child attended. We may infer that the reason for these significant school and classroom effects is that different "inputs"—school policies and classroom experiences—were received by children, depending on the schools and classrooms they were enrolled in. We may also infer that these different policies and experiences are very important in determining each child's reading achievement, even after taking account of the many strong nonschool factors that obviously affect student's learning. This finding confutes the conclusion of several cross-sectional studies, including the Coleman Report, that school differences are only slightly related to achievement

once background variables have been taken into account. (See Mosteller and Moynihan, 1972, pp. 15-16, 19-22.)

The answer to the management question, then, seems to be that *both* individual schools *and* individual classrooms are affecting students' reading achievement levels. Certain schools and classrooms in our sample produce students whose reading achievement is higher than that of students elsewhere who started with similar 5th grade scores and backgrounds. This finding is consistent with the district's policy of goal-setting for reading at the individual school level, and with granting substantial responsibility, authority, and some resources to schools as they work to carry out their programs. Because schools in the district are clearly diverse, it makes sense to permit them substantial autonomy in managing their affairs; this policy is consistent with our findings on the *ability* of schools and teachers to pursue policies that produce reading gains for their students.[4]

Such diversity points up the impossibility of formulating a "quick fix" policy to promote equal reading gains in all of the district's classrooms. (Our analysis of the factors that produced improved reading achievement also suggests that no massive programs or single strategies can raise reading scores all at once.) However, it may be possible to improve reading on a school-by-school and classroom-by-classroom basis.

The finding that the classroom to which a child is assigned is a significant predictor of his or her progress during the school year permits an analysis of individual teachers' contributions to students' learning gains. (If there had turned out to be no differences among classrooms with respect to students' gains, then it would not be possible to compare teachers' classroom reading activities to see which are most effective, as we shall do in the next section.) Our findings regarding the management question, then, are that classroom outcomes are diverse and that classroom policies are important contributions to reading achievement. The next section discusses the nature and magnitude of these contributions.

THE SCHOOL ALLOCATION QUESTION: HOW SHOULD RESOURCES AND ENERGIES BE ALLOCATED?

The success of the reading program critically depends upon discovering how to use the limited supply of school resources and staff energies in a school to the greatest positive effect. Since principals and school staff members must constantly choose among many policies for enhancing reading achievement, we examined the relationship of reading to a number of such policies. We focused on school "inputs"—the things that may affect reading growth—that are actually under the control of the individual school, its teachers, and its community. We will discuss four such categories of reading inputs:

[4] If we had found that a child's school and classroom did not contribute to determining his or her reading achievement, we would have concluded that there was no basis for allocating the responsibility and authority for reading programs to the schools. The fact that our finding is that schools and classrooms do matter is consistent with allocating responsibility to the schools, but *it is not sufficient evidence that this should be done.* This is because we could not investigate the effects, if any, of varying the district's policies regarding school authority and responsibility, since these policies did not vary in our sample. In particular, we did not consider the effects of policies that could hold individual schools accountable for students' gains, if the schools were to be given additional authority over their programs.

- The *teacher attributes* that shape the instructional process,
- The *classroom setting* in which reading is taught,
- The curricular and instructional *methods* used, and
- The *implementation* of programs for reading instruction.

We conducted our analysis for slightly less than 400 Black students who were 6th graders in 1974-75. We analyzed the increase in reading achievement that occurred during the 6th grade, using data on students who took reading tests at the end of the 5th and again at the end of the 6th grade, and who were enrolled in classrooms whose teachers completed a lengthy questionnaire that probed approaches to reading instruction, attitudes, and other attributes. The questionnaires allow us to examine in detail which classroom factors produced reading gains; our results depend directly on the cooperation of 81 teachers who took the time to answer our questions. (Two teachers did not complete the questionnaire. Because we lacked information about their classroom practices, it was necessary to exclude their students from our analysis.)

We conducted equally extensive analyses for Mexican American students, but were unable to uncover statistically significant relationships between their achievement and the school inputs we measured. Since we know that school and classroom differences are important determinants of their reading achievement, we conclude that we were unable to discover what policies account for their learning. This may be due to poor measurement, erroneous model specification, or insufficient information (perhaps on students' English fluency).

The analysis considered the effects of a large number of school and classroom variables, while statistically controlling for each child's starting point (the 5th grade score), attendance, any significant health problems, and the child's age, sex, and family background.[5] To correct for validity problems raised by test exposure, we excluded students in the six classrooms where our field research indicated that test exposure almost certainly occurred. (A discussion of the sensitivity of our results to this correction is presented below.)

The school and classroom variables that we measured reflect four kinds of educational "inputs" to student reading achievement: teacher attributes, the classroom setting, instructional methods, and the implementation of the reading program.

We investigated the effects of variables related to each of these factors on 6th grade reading achievement, after controlling for the effects of prior achievement and student background. Since prior achievement and student background obviously

[5] The influence of various groups of school and classroom factors on students' reading achievement was estimated using a multiple regression analysis. The dependent variable in the regression equation was a student's 6th grade reading score; independent variables were the student's initial achievement (5th grade score), control variables (the student's attendance, sex, age, health, family background, and the supplementary nonclassroom services received), and the school and classroom factors. The existence of substantial multicollinearity (i.e., complex patterns of correlations among independent variables) in the data led us to evaluate carefully which of our measured variables reflected the same underlying conceptual variables, to identify representative measures of these underlying phenomena, and sometimes to create new measures by combining responses to two questionnaire items (by multiplication or by linear combination). These efforts were guided by our categorization of school inputs into teacher attributes, classroom setting, instructional methods, and program implementation. We attempted to select meaningful and representative variables from categories, within each of which we anticipated considerable multicollinearity. When we encountered high collinearity between variables in different categories, we investigated the theoretical and empirical reasons for the collinearity and based our decision on those reasons.

account for most of the variation in school achievement (see App. B), we are interested in the incremental contribution of school and classroom inputs to students' reading gains.

We now turn to a discussion of the effects that we found to be significant contributors to reading achievement, beyond the effects of prior achievement and student background. Table 3.2 presents the statistical relationships between reading achievement and the school inputs we identified as important.[6] (A detailed description of the variables that were entered into the multiple regression analysis can be found in App. C.)

Teacher Attributes

We analyzed two groups of teacher attributes: background characteristics and predispositions. We collected data on several background characteristics: the teacher's race and ethnicity, college attended, undergraduate major, whether any graduate training was received, amount of college instruction in reading, and teaching experience. We found no evidence of a relationship between any of these characteristics and students' reading achievement. Three explanations are possible. First, teachers' decisions about reading instruction, and their teaching skills, may be unrelated to background characteristics. Second, it is possible that a teacher's background influences reading, but in an interactive fashion; for example, a teacher's undergraduate major in English might raise reading achievement only if the teacher used literature and creative writing as part of the curriculum. Since we did not analyze any of the possible interactive effects of teacher background, we could not detect any such influences, even if they existed. Third, we know that teacher characteristics come in clusters; for example, many of the teachers who graduated from California State University at Los Angeles also majored in academic subjects, rather than in education. As a result of this clustering, it is not possible statistically to identify separate effects of the different characteristics, even if those effects exist. (There may well be effects of teacher background characteristics on student outcomes that we did not measure—for example, students' self-concept. We restricted our analysis to the influence of school factors on reading achievement.)

We also measured one aspect of teachers' individual attitudes toward teaching in minority schools: their sense of efficacy in dealing with minority students.

Our measure of teachers' feelings of classroom efficacy is based on two questions.[7] One asked whether the teacher felt that "when it comes right down to it, a teacher really can't do much (because) most of a student's motivation and performance depends on his or her home environment." The other asked whether the teacher thought that "if I try really hard, I can get through to even the most difficult or unmotivated students." Responses to these questions were combined into a single measure of efficacy—the extent to which the teacher believes he or she has the capacity to produce an effect on the learning of students. The more efficacious the teachers felt, the more their students advanced in reading achievement. This mea-

[6] Table 3.2 presents regression coefficients and t-statistics. Regression coefficients measure the increase in the dependent variable (6th grade score, measured on a 100-point test) produced by a one-unit increase in each independent variable (the school inputs). The t-statistics measure statistical significance, which we have coded with asterisks.

[7] The standard discussion of efficacy, on which we based our instruments, is J. B. Rotter (1966).

Table 3.2

FACTORS PRODUCING IMPROVED READING FOR BLACK CHILDREN

Factor	Coef.	t-stat.	Mean	S.D.
TEACHER ATTRIBUTES				
Sense of efficacy	0.31	2.54**	17.1	6.6
CLASSROOM SETTING				
Disruptions	-1.75	-3.21***	2.2	1.2
Number of parent visits	0.05	1.72**	30.9	30.9
PROGRAM CONTENT				
Variety of materials, with amount of training (linear combination)	0.65	1.81**	2.8	2.1
IMPLEMENTATION STRATEGIES				
Teacher adaptation of program	0.11	1.39*	19.8	9.6
Teacher-to-teacher consultations	0.66	1.41*	5.0	1.6
R^2 = .695				
Unconstrained R^2 = .581				
N = 356				

NOTE: Table based on regression analysis of 6th grade CTBS-Q2 raw reading score on 5th grade CTBS-R2 raw reading score, sex, attendance, health problems, family status, father's occupation, mother's occupation, age, whether additional services were received under remedial reading or gifted programs, and the variables displayed above. Unconstrained R^2 is based on the equation with background variables only, excluding those displayed above.

Statistical confidence levels for t-statistics:

*p <0.10

**p <0.05

***p <0.01

sure was strongly and significantly related to increases in reading. Obviously, teachers' sense of efficacy is only one part of the morale and commitment to teaching that we presume is a major influence on learning. Our finding that efficacy affects achievement demonstrates the importance of these predispositional factors for effective teaching.

The data do not enable us to determine whether it is possible to raise teachers' feelings of classroom efficacy by providing more training, support, or supervision for those who wish it. It is possible that an improvement in teachers' morale and commitment could be produced by school policies that support teachers and help them solve their classroom problems, and that their sense of efficacy might improve as a result. (Another possibility is that the teachers with lower feelings of efficacy are factually describing a problem in the way they teach that is not subject to improvement without, for example, a change in the kind of school or classroom to which they are assigned, or some other substantial change in the nature of their work.)

Teachers can affect students' reading gains in many other ways; the variables we have just discussed refer only to their predispositions and background attributes. Other aspects of teachers' inputs to student achievement—such as their teaching skills, classroom management, and expertise in individualization—are discussed under other headings, though they clearly are important parts of teachers' influence on children.

Classroom Setting

Because classrooms are highly diverse and complex social and instructional environments, we attempted to analyze the effect of the classroom setting on students' reading progress. We asked teachers to tell us about several aspects of last year's classroom setting: the level of disruption (fights, vandalism) in each classroom, the number of parents who visited the classroom, and the number of home visits made by each teacher. (We regard the latter two measures as classroom setting indicators because they characterize the classroom situation in which a strong relationship of home and school experiences is made apparent to children.) After taking account of a student's initial achievement (the 5th grade score), background, and attendance, we found (not surprisingly) that the greater was classroom disruption, the smaller was the growth in reading achievement. Disruption may be caused by only a few students, but it affects the whole classroom. Valuable instructional time is lost as teachers strive to restore order and resolve discipline problems. To the extent that school policies and resources can be used to help teachers prevent disruption and establish a climate of orderly and productive learning, the improved classroom setting can be expected to increase reading achievement.

Greater numbers of parent visits to the classroom also were associated with higher levels of reading progress.[8] For our sample of 6th grade teachers, the median number of visiting parents was 15 (the median number of home visits was two). We speculate that the relationship between parent visits and reading achievement reflects teachers' varying success in drawing parents into the educational process. We examined whether the individual students whose parents met with the teacher had improved reading scores; they did not. Parents visiting in classrooms apparently affect students as a group; this finding contributes to our belief that parent visits reflect the *atmosphere* of a classroom.

If the foregoing speculations are accurate, a policy that strongly encouraged parent visits might not necessarily produce increased reading achievement. This is because the number of visits may be simply an indicator of certain teachers' capabilities for enhancing student motivation and work habits by involving parents. If so, merely mandating the use of visitation would not automatically raise other teachers' capabilities to affect these processes. However, it is clear that classrooms that were visited by parents received a benefit in reading achievement that applied to all of its students.

[8] Because parent visits and teachers' home visits were highly correlated, $r = 0.89$, and appear to measure the same kind of classroom atmosphere, we concentrated our quantitative analysis on parent visits.

Curricula and Instructional Methods: Substance of the Reading Program

A teacher's reading program may affect achievement for two reasons: because of its specific content and approaches, or because of the way it is applied by an individual teacher. Without direct observation of each teacher's combination of teaching methods, techniques for reading instruction, grouping practices, and use of materials, only summary measures of teachers' instructional activities can be gathered. The enormous diversity of pedagogical approaches being used in our 20 schools further complicates any statistical analysis based on a restricted number of teachers. While recognizing these serious limitations, we collected data on several aspects of each teacher's reading curriculum and instructional methods.

Our data enabled us to consider the effect on reading instruction of the following curriculum elements:

- Techniques for reading instruction (individual diagnosis, word-attack, comprehension, and supplementary reading methods,[9] as well as the amount of time spent on reading instruction),
- Nontraditional teaching techniques (team-teaching and open classroom approaches[10] that deviate from traditional classroom methods), and
- Teachers' use of a variety of materials for different students at the same time.

In general, the curriculum measures that we investigated were not systematically related to better or worse levels of reading achievement. The absence of significant statistical relationships probably means that the curricula were used in some *effective* ways and some *ineffective* ways, and that on balance there was no predictable effect due to a teacher's merely having used a particular curriculum or technique. An important exception to this general conclusion is our finding that teachers' use of a *variety* of materials *was* strongly related to increased reading achievement. This finding relates to the way teachers actually apply a teaching technique, rather than to particular characteristics of a technique or approach.

Because there is a great deal of variation in the ways that any particular reading curriculum can be carried out in classrooms, we attempted to formulate a measure of the actual behavior of teachers in relation to the most frequently emphasized instructional approach to reading, that of individualized and diagnostic instruction. We asked teachers how much their school's reading program had actually affected their "use of a greater variety of materials for different children at any one time." Our case studies provided evidence that this behavioral measure reflected an important area of reading instruction: the extent to which teachers deal effectively with the complex and difficult operations required for individualization. Our finding that

[9] Individual diagnosis techniques emphasize the specific, highly disaggregated skill weaknesses that each child has as he or she progresses. Word-attack techniques are aimed at improving a child's ability to decode (or "sound out") unfamiliar words, usually emphasizing phonics. Supplementary reading techniques emphasize comprehension through spelling, study skills, and the teaching of reading in other subjects, such as social studies. Comprehension strategies use story reading and oral reading to increase students' understanding of what they read.

[10] Team-teaching is a technique in which two or more teachers share the responsibility for their classes, with each teacher teaching certain subjects to all of the students. Open classroom approaches involve more child-centered, independent-study tasks than the "teacher-centered" traditional classroom in which teacher assignments and the lecture method predominate.

a teacher's use of a greater variety of materials was positively related to reading achievement supports the interpretation that an individualized curriculum (when thoroughly put into practice) produces higher achievement. The likely importance of effectively *implementing* such a reading program led us to inspect the relationship of varied materials usage to the amount of training received by teachers; in addition, their correlation is substantial, perhaps because it takes new ideas and skills for teachers to effectively use diverse materials simultaneously. When we combined the effects of varied materials usage and teacher training (to reflect the interdependence and the frequent joint occurrence of these two classroom inputs), we found a very large and significant relationship with reading achievement. (See Table 3.2.)

The numerous specific curriculum measures for which we did *not* identify significant relationships to reading outcomes included the following:

1. *Various techniques for reading instruction.* For the four major clusters of reading strategies we investigated (individual diagnosis, word-attack, comprehension, and supplementary reading), our general finding is that the use of any particular approach seems *not* to be associated with higher or lower progress in reading. (Our measure of individual diagnostic techniques was much less strongly related to reading achievement than was the use of varied materials, despite their conceptual similarity. We hypothesize that variety of materials is a more "behavioral" measure of actual individualization, as compared with teachers' reports of whether so-called individualized techniques are in use.)

2. *Nontraditional teaching techniques.* We did not discover a significant relationship between either team-teaching or open classroom approaches and students' reading achievement. In other words, some students benefited from these teaching techniques and others did not; on balance, no systematic effect on reading achievement was produced.

It would be incorrect to conclude that these techniques are not useful. With the exception of the extent to which varied materials are used for different students, which proved to be a strong and effective strategy, we would conclude that there is a great deal of variation in the effectiveness with which various reading programs have been used in our sample classrooms.

We also found no significant relationship between achievement and time spent on reading instruction. (Reading time per day ranged from 45 minutes to two hours.) We would suggest an interpretation of this finding parallel to our explanation of the effect of reading strategies: we do not know that more instruction does not help, but we do believe that there is great variation in how effectively instructional time is spent. The implication is that administrators and teachers should concentrate on policies for enhancing the quality of reading instruction, rather than mandate an increase in its quantity. It appears that the quality of a reading program is not necessarily determined by its content or its quantity (within limits). Instead, quality seems to depend on how well the school's reading program—whatever it is—is adapted to the needs and capabilities of each teacher and classroom. This link between a reading program and student achievement can be good or bad, effective or ineffective, for a wide variety of specific reading programs.

Implementation of Reading Programs

We investigated the ways in which the 20 schools implemented their reading

programs. By implementation we mean the policies and activities that affected how easily, how flexibly, and how thoroughly the reading program was carried out by teachers in each school (as opposed to the specific instructional content of the reading program). We studied implementation because educational programs are not self-propelling; they do not automatically begin to function in every situation just as their designer intended they should. Instead, each teacher must find practical ways to carry out the reading program, taking into account his or her strengths and weaknesses, students' capabilities, interests and motivations, and the support and facilities made available by the school. The various ways in which the new reading programs were installed—with or without the use of training, for instance—varied greatly for the teachers and schools in our sample. We found that implementation decisions do affect the level of achievement produced by reading programs.

The role of teachers in implementing a reading program can be either large or small, for any particular kind of reading program. In examining the influence of the teacher's role in implementation on improvement in reading, we collected information on whether teachers were encouraged to conform to a predetermined program or asked to contribute their own ideas. Students' reading achievement was reduced where teachers felt that their reading instruction was expected to conform closely to the school's reading program guidelines.

Conversely, the more that teachers were encouraged to adapt or modify the reading program on an individual classroom basis, the more their students increased in reading achievement. These effects of teachers' flexibility in program implementation were quite strong. Because these two measures appear to capture a single dimension of teacher flexibility in implementation, and since they were highly correlated, we combined them by multiplication into a single measure, which is strongly and significantly related to improved reading: the more flexibility, the greater the reading achievement. See Table 3.2. (Of course, there is a limit to this finding: when teachers are completely independent in deciding how to teach reading, then there is no school-wide program, and school policies are irrelevant to classroom outcomes.)

Because the teaching of reading is a difficult and complex task, many of the schools used some of their discretionary budget to provide training and resource staff to assist teachers in putting the reading program into action. We analyzed the effects of several of these "implementation strategies," which attempt to increase the effectiveness of the reading program by helping teachers to get the most out of whatever reading system has been chosen. We found that additional training contributed to effective implementation of reading programs; as we discussed earlier, we combined our measure of training with the measure of teachers' use of varied materials, in order to sharpen the effect of that aspect of curriculum on reading outcomes. We also found that teachers' informal consultations with other teachers about the reading program produced significant advances in their students' reading; in a sense, teachers are an expert resource for their colleagues, and the value of their experiences for other teachers trying to implement the reading program can be quite high. The relationship of teacher-to-teacher consultations to increased reading achievement was strong and statistically significant. The implication of this finding is that implementation problems can be solved by staff members in each school.

While our research did not investigate the costs of any of these strategies for implementing new reading programs (and so cannot judge their cost-effectiveness),

we were able to document the substantial positive influence on reading that is due to training and teacher-to-teacher consultation. Since these approaches can be used with any reading program, they may present opportunities for school officials to assist teachers in implementing a wide range of instructional methods for reading. Our findings regarding the implementation of reading programs reinforce the idea that how a program is carried out may well be more important than its particular techniques and methods.

While the school inputs we have found to be related to reading achievement are significant predictors of reading improvement, their interpretation depends to some extent on our assumptions about the validity of the district's test scores that we analyzed. To show the extent to which the findings are sensitive to our corrections for possible invalidity of test scores, Table 3.3 presents separate analyses for three groups of Black students. First, we performed the analysis of effective reading factors for all of the Black students in our sample. Second, we obtained results for the sample excluding students in the six classrooms where our field research indicated test exposure almost certainly occurred. (This is the sample corrected for probable test exposure that we used as the basis for the analysis discussed above.) Third, we further excluded all students in the four classrooms where a large proportion of students made very large gains. (We had done additional fieldwork in an attempt to locate evidence of test exposure in each of the high-gain classrooms, but obtained no additional independent reports of test exposure.) As to be expected, our results are sensitive to which groups of students are included and which are excluded; we conducted three analyses to enable us to evaluate the implications of

Table 3.3

COMPARISON OF REGRESSION RESULTS, WITH CORRECTION FOR POSSIBLE TEST EXPOSURE

	All Black Students		"Exposed" Students Excluded		"Exposed" and High-Gain Groups Excluded	
Factor	Coef	t-Stat	Coef	t-Stat	Coef	t-Stat
Disruptions	-2.02	-3.6	-1.75	-3.2	-0.85	-1.6
Number of parent visits	0.01	0.3	0.05	1.7	0.004	0.1
Sense of efficacy	0.34	2.8	0.31	2.5	0.37	3.3
Variety of materials, with amount of training	0.95	2.6	0.65	1.8	0.66	1.9
Teacher adaptation of program	0.15	1.9	0.11	1.4	-0.001	-0.01
Teacher-to-teacher consultations	0.89	1.9	0.66	1.4	0.19	0.4
R^2	0.67		0.70		0.76	
Unconstrained R^2	0.55		0.58		0.73	
N	373		356		266	

NOTE: Table is based on regression analyses of 6th grade CTBS-Q2 raw reading score on 5th grade CTBS-R2 raw reading score, sex, attendance, health problems, family status, father's occupation, mother's occupation, age, whether additional services were received under remedial reading or gifted programs, and the variables displayed above. Unconstrained R^2 is based on the equation with background variables only, excluding those displayed above.

choosing among them. It is our judgment that the effect of school factors is most accurately captured by using the analysis based on the second group of students (excluding the six classrooms with direct field evidence of test exposure.)[11] We regard the sample that excludes classrooms with reports of test exposure as judiciously correcting our analysis for potential bias; the preceding discussion of effective school factors is therefore based on it. The other two samples are extreme comparison cases, representing hypotheses of "no bias" (the complete sample) and "worst-case correction" (the sample eliminating all high-gain classrooms). As Table 3.3 shows, the sample excluding all high-gain classrooms exhibits weaker effects than does the sample excluding only test-exposed classrooms. (The complete sample shows effects that are mostly similar to those of the second, "middle-ground" sample.) The reader who judges that all the classrooms exhibiting high gains ought to be excluded should exercise caution in regard to our findings. The analysis based on the middle-ground sample strongly supports the theory and findings of comparable studies (particularly the Rand study of school innovations, *Federal Programs Supporting Educational Change*. This congruence of findings is, in itself, corroboration of the validity of our preferred sample.

The separate effects of the school inputs we found to be important to reading are small compared with their combined power. As an exercise designed to illustrate the hypothetical overall effect of the reading approaches we have identified as effective, we have performed a simulated experiment based on our study results. Table 3.4 presents the simulation, performed for samples based on both the middle-ground and worst-case assumptions regarding test validity. The *average* student in the samples had a raw score of about 36 on the 5th grade CTBS-Form R2. This corresponds to a percentile rank of about 25. Had this student attended the *average* school and *average* classroom among those we studied, his or her CTBS-Q2 raw score at the end of the 6th grade would have been about 51, which would have meant placement at the 22d percentile on the national norms for the 6th grade. If, instead, this same student had been exposed to all of the most effective school and classroom factors we were able to uncover, his or her hypothetical raw score would have been further increased by between 7 and 13 raw score points (depending on whether all high-gaining classrooms are excluded, or only those in which field evidence supported the presumption that test exposure occurred). These alternative results would have placed the hypothetical student at the 32d (raw score of 58) to 43d (raw score of 64) percentiles. Thus an optimal approach to reading instruction has the potential of adding 10 to 20 percentile points to students' 6th grade reading scores. In the light of prior research findings on the downward trends in percentile ranks of minority children as they grow older, our results suggest the possibility of reversing the expected patterns and producing a turnaround in test performance when measured longitudinally.

Relating Reading Achievement to School Decisions

The analysis of the school allocation question has focused thus far on identifying

[11] That analysis corrects our sample for the "omitted variable" of test exposure; it uses the information we have gathered about the actual occurrence of test exposure, without ignoring potential biasing effects (as the complete sample does), and without unduly restricting the variability of test scores in the sample (as excluding all of the high-gaining classrooms tends to do).

Table 3.4

AVERAGE AND SIMULATED READING SCORES FOR BLACK CHILDREN, FOR ALTERNATE ASSUMPTIONS ON TEST VALIDITY

Reading Score	Sample Excluding: Classes with Verified Test Exposure	Sample Excluding: All Classes with Very High Gains
5th grade		
Average raw score	35.8	37.6
Average gain	15.8	13.4
6th grade		
Average raw score	51.6	51.0
Hypothetical increase from effective factors	12.6	7.4
Hypothetical 6th grade raw score with effective factors	64.2	58.4

NOTE: Scores are based on samples of Black children for whom complete data were available. "Classes with verified test exposure" are those six classes for which there was field evidence of test exposure. "All classes with very high gains" comprise four more classes for which there was some statistical evidence that the district's reading scores may not have been valid. Hypothetical scores were computed using regression coefficients in Table 3.3. Data on "effective factors" are the highest values on the school inputs that occurred in our sample.

the inputs that are associated with reading achievement. Another approach to the question of how to improve minority students' reading instruction is to investigate whether adequate and accurate information is available to administrators at individual schools, so that they can act to identify and correct instructional weaknesses, and can support the strengths of the instructional program. The complexity and extremely large size of the LAUSD make it unproductive for many important educational decisions to be made centrally. (Our findings regarding teachers' flexibility in implementing the reading program cast doubt on the wisdom of such a policy, even if it were possible. In fact, the district's School Preferred Reading Program clearly emphasizes the need for individual schools to have substantial autonomy in planning their reading programs.) Therefore, we have attempted to discover whether principals possess sufficient information to judge the effectiveness of each of their teachers.[12]

We asked principals to describe the performance of their 6th grade teachers on several dimensions of classroom style and effectiveness in reading instruction. Their responses represent what they believe to be the strengths and weaknesses of each of their teachers. These descriptions, taken as a group, were strongly correlated with the reading achievement of students in each teacher's classroom. Because it was

[12] This analytical approach was first used in Richard J. Murnane's study, *The Impact of School Resources on the Learning of Inner City Children*, Ballinger Publishing Company, Cambridge, Massachusetts, 1975.

difficult to identify which dimension best reflected the actual gains made in a teacher's classroom (because of intercorrelations among the assessments), however, we combined the multiple measures into a single summary of the principal's assessment of each teacher. The data indicate that the sum of the principal's descriptions of each teacher was a very good predictor of students' reading achievement. (See Table 3.5); note that this analysis finds that principals' assessments, both positive and negative, are *accurate predictors* of reading outcomes—*not* that principals' assessments *produce* certain outcomes.)

Clearly, then, principals have the information and the analytic capacity to identify their teachers' instructional strengths as well as the problems facing them. Whether or not they have the time, resources, and desire to act on that knowledge, we cannot say. Yet one implication of this finding is that principals may have enough information to make policy decisions at the school level.

We found principals' assessments to be good predictors of student reading outcomes for *both* Black and Mexican American students. (See Table 3.5.) Despite our inability to identify statistically significant relationships between specific classroom inputs and the reading achievement of Mexican American children, it is clear that the principals of schools serving these children *are* able to identify effective and ineffective classrooms, based on their observation of each teacher.

Answers to the School Allocation Question

This analysis has attempted to illuminate the central allocation problem confronting school staff: How can the school's finite supply of resources and staff energy be most effectively used to increase reading achievement? We found school factors that are strongly related to reading achievement, as well as numerous factors that show no relationship to achievement. We regard these findings as offering suggestions for educational policy decisions.

Teachers matter for reading: their sense of efficacy in teaching minority children contributes to reading achievement. This finding is important both for teachers—whose investment of energy and commitment in the educational process is too frequently underemphasized—and for school officials who may be able to support the morale and commitment of teachers.

Classroom atmosphere affects the reading gains of all of the students in a class. Our measurements of the classroom setting are not subtle, but they confirm that the background for learning can affect teachers' and students' productivity. Classes with high levels of disruption had diminished reading achievement; classrooms with frequent parent visitors had increased reading achievement. These measures of the setting created by the school and the teacher, and probably other aspects of the classroom setting whose effects we did not measure, are significant determinants of reading improvement. If there are barriers to the improvement of classroom setting that are remediable by using school resources and staff energies, then principals may be in a position to produce a reading "payoff" by removing the barriers.

Instructional programs can contribute to reading success, though merely introducing a new reading system will not necessarily affect achievement. Reading curricula do not, by themselves, determine a program's success or failure. Achievement varies widely among classrooms that have very similar curricula and reading strategies. This may imply that any of the reading programs we studied *can* be effective

Table 3.5

PRINCIPALS' ASSESSMENTS AS PREDICTORS OF READING ACHIEVEMENT

Item	Black Students	Mexican American Students
Coefficient of principals' assessments sum	0.22	0.10
t-statistic	3.24	1.90
Confidence level for t-statistic	$p < 0.001$	$p < 0.05$
Mean, standard deviation	39.7, 8.8	41.0, 7.4
R2 of equation	0.586	0.665
Number of cases	405	500

NOTES: Table is based on regression analysis of 6th grade CTBS-Q2 raw reading score on 5th grade CTBS-Q2 raw reading score, sex, attendance, health problems, family status, father's occupation, mother's occupation, age, whether additional services were received under remedial reading or gifted programs, and the sum of principals' assessments of each child's classroom teacher.

The principals' assessment sum includes the following components, each measured on a quantitative scale:

—Maintaining consistent and reasonable control and discipline in the classroom;
—Planning and executing lessons and other classroom activities creatively and thoroughly;
—Creating an atmosphere of excitement and eagerness to learn ("turns kids on");
—Implementing the reading program as it was laid out, according to guidelines and on schedule;
—Effectively using a management system to monitor students' acquisition of reading skills;
—Individualizing reading instruction to address the needs of each learner (e.g., effective use of flexible grouping);
—Effectively combining comprehension and skills instruction to create a balanced reading curriculum;
—Helping students to develop skills necessary for good performance on standardized tests;
—Developing effective learning centers in reading and other content areas.

depending on how it is used; at the same time, it appears to indicate that the implementation of reading instruction, rather than its substance, affects success. The curriculum approach that did show a relationship to reading growth was the use of varied materials for different children at the same time; the effect of this variable was enhanced when it was combined with increased amounts of teacher training in how to apply the reading program.

Program implementation affects reading achievement across a range of instructional methods and school settings. The *way* in which a reading program is carried out strongly affects how much students learn. This is true even after taking account of the impact of curriculum, classroom setting, and teacher attributes. In particular, the more active teachers were in deciding how to implement the reading program, the more reading achievement improved. Our findings that both the amount of training and the extent of teacher-to-teacher consultations are related to reading

achievement may offer opportunities for improving some programs. In general, implementation strategies are a crucial and often overlooked component of effective school programs.

Principals know which classrooms have problems and which are particularly effective. Our analysis demonstrated that principals' assessments of teachers accurately predicted which students improved most in reading. While it is likely that parents and teachers will also have information about school problems, the principal has a unique opportunity to observe the whole situation at his or her school, and act to improve it. As the full-time managers of their schools' educational programs, principals have the knowledge to decide when and where changes are needed.

These findings show a consistent pattern: the effectiveness of a reading program depends much more heavily on school and classroom policies and decisions than it does on the packaged content of the program or on teachers' background characteristics. The latter two were not among the effective factors we identified. In whatever reading program is selected, much more important factors appear to be orderliness in the classroom, teachers' confidence in their own efficacy, and the adaptation of a variety of materials to perceived classroom needs. So are teacher training, informal consultations among teachers of reading, and flexibility for teachers in applying the reading program to their particular classrooms. The most promising avenue for reading improvement therefore appears to lie in making a reading program effective at the individual school and classroom level. No one has yet devised a prepackaged program or set of techniques that will automatically produce gains for all schools, whether minority or otherwise, merely by being put into operation.

CONCLUSIONS

This chapter has dealt with two issues:

- The management question of the extent to which district-, school-, and classroom-level decisions have differential effects on reading achievement, and
- The school allocation question of how a school's limited resources and energies can be allocated to produce improved reading.

In our analysis of the management question, we examined whether or not a student's school and classroom had an impact on his or her 6th grade reading achievement. We found that individual schools and classrooms are highly significantly related to students' reading achievement, for both Black and Mexican American children. In our study of the school allocation question, we analyzed the effects of a wide variety of factors on achievement. Most of the specific attributes and programmatic factors had little effect on reading, providing evidence that classroom-level implementation—rather than any technical solution—is the central factor in 6th graders' reading progress. Moreover, we were able to identify some particular school and classroom factors that have substantial power to influence reading achievement for Black students. Despite our efforts to identify such factors for Mexican American students, our analysis was confounded by the effects of unmeasured variables (and perhaps by variation in the level of English fluency across Mexican American children.) Finally, we found that principals possess accurate

information about the relative strengths and weaknesses of their teachers in reading instruction, for both Black and Mexican American students.

Our answers to both the management question and the school allocation question tend to reinforce the intent and the policies that make up the district's School Preferred Reading Program. The program established substantial local autonomy for schools in deciding on their instructional package for reading; our analysis of the management question shows that there are, indeed, important effects on reading that originate in individual schools and classrooms. The program emphasizes teacher involvement in implementing the reading program; we found that such involvement increases achievement. The program mandates parent involvement in each school's reading program; we found that parent visits to the classroom are associated with improved reading. The program requires that schools carefully consider the means they would use to implement their reading program, and in particular to assure that adequate training and staff development are provided; our analysis showed the importance to reading achievement of the implementation strategies selected, not just of the techniques of reading instruction. Finally, the program places considerable responsibility for reading outcomes in the hands of each school; we found that principals' information about reading instruction in classrooms matches the actual record of achievement. Our findings show that the policies of the School Preferred Reading Program are important ones for the achievement of minority students.

BIBLIOGRAPHY

Boardman, Anthony E., *Simultaneous Equation Models of the Educational Process,* Ph.D dissertation, Carnegie-Mellon University, Pittsburgh, Pa., 1975.

Federal Programs Supporting Educational Change, Vols. I-IV, various authors, The Rand Corporation, R-1589/1-4-HEW, 1974, 1975.

Hanushek, Eric, *The Value of Teachers in Teaching,* The Rand Corporation, RM-6362-CC/RC, December 1970.

Mosteller, Frederick, and Daniel P. Moynihan (eds.), *On Equality of Educational Opportunity,* Random House, New York, 1972.

Murnane, Richard J., *The Impact of School Resources on the Learning of Inner City Children,* Ballinger Publishing Company, Cambridge, Mass., 1975.

Rotter, J. B., "Generalized Expectancies for Internal Versus External Control of Reinforcement," *Psychological Monographs,* Vol. 80, No. 1, 1966.

Zirkel, P. A., "Spanish-Speaking Students and Standardized Tests," *Urban Review,* Vol. 5, No. 6, June 1972, pp. 32-40.

Chapter 4

ELEMENTS OF A SUCCESSFUL READING PROGRAM: EFFECTIVE SCHOOL AND CLASSROOM FACTORS IN PRACTICE

Our statistical analysis has indicated a number of factors that can contribute to improved reading achievement. However, limits on available resources make it difficult, if not impossible, to implement school- and classroom-level programs that will maximize the positive effect of *all* these factors.[1] This chapter describes several successful techniques, implementation strategies, and staff characteristics explored in our visits to the sample schools. The purpose is to show that, while no single factor is sufficient to produce notable gains, a combination of selected factors may do so. Consequently, the schools and classrooms included in this chapter were not chosen because they were successful in all aspects of their reading programs; rather, certain elements of their programs illustrate what the positive factors found in our statistical analysis look like in practice. We hope this discussion will be useful to principals and teachers seeking to improve their own schools' reading programs.

SCHOOL-LEVEL POLICIES AND CHARACTERISTICS

Among school-level factors that affect reading achievement, the leadership role of the principal is one of the most important. As a group, the principals in our sample knew which classrooms had problems and which were particularly effective. How an individual principal acts on this kind of information constitutes part of his or her management task. Principals use a variety of approaches, of course, but the most effective principals we observed were able to achieve a balance between a strong leadership role for themselves and maximum autonomy for classroom teachers. These principals conceived of their role as promoting three broad goals:

- To create, through example and positive reinforcement, norms that emphasize hard work and dedication;
- To establish incentives for greater professionalism and classroom-level innovation; and
- To maintain an environment that supports teacher efforts in the classroom and minimizes outside factors that can disrupt the learning process.

The principals have worked to achieve these goals in a number of ways. For example, some principals stress the contribution the school is making to the community. They continually emphasize to teachers the ways that a hard-working staff can strengthen the school and, in turn, serve the community well. Principals may

[1] Because none of the classrooms or schools we observed embodied all the factors discussed in this chapter, we do not know empirically what the effects of all these variables would be if they were used simultaneously. If it were practical to implement all of them, however, there is no reason to believe they would exert anything other than a positive effect on reading achievement.

try to encourage greater professionalism and classroom-level innovation in the way they allocate extra materials and resources to individual classrooms—giving a proportionately larger share to teachers who wish to implement new approaches. Other principals have used a faculty newsletter to discuss new and effective techniques that particular teachers are trying, thereby highlighting innovative approaches and reinforcing teacher initiative.

Those principals who were most effective in maintaining a school environment supportive of teacher efforts visited individual classrooms often (perhaps once a week) and went there with a specific purpose in mind. For example, they might observe whether learning centers had been established or whether students had been given clear guidelines for working independently. On some visits, the principal was accompanied by the reading coordinator or a reading resource teacher. In any event, the principal would try to coordinate his or her perceptions of teacher needs and teacher requests for additional material or assistance with the reading specialists. The teachers therefore knew there was administrative concern with and interest in what went on in the classroom. These visits also provided information to principals about the kinds of support that would be most useful to particular teachers. Our analysis indicated the importance of classroom visits by parents. Here again principals can take constructive action. They can encourage parental and community involvement, and with the right kind of programs can be instrumental in actually bringing parents into the school. Principals at several schools we visited have stimulated parental involvemnt in the school by establishing extensive activity programs and by encouraging teachers to seek the involvement of their students' parents. School choirs and other extracurricular activities have been started for the students, and a full program of events has been organized to involve parents, including mother-daughter teas and parental participation in school-sponsored athletic events, such as bowling nights and baseball games. All such activities are designed to bring parents to the school in an informal and unthreatening way. Principals and teachers at schools that have used such techniques have found that parental participation in nonacademic events has often expanded into an interest in the school's academic program. (The effectiveness of these approaches is further explored in Chap. 5, from the perspective of parents.)

Other payoffs from these activity programs can also affect reading achievement. A well-rounded program of extracurricular activities often motivates more children to come to school regularly (and thus to reading classes). Principals believe that these programs raise teacher morale. Teachers see that parents are interested in the school, sometimes to the point of paying attention to the maintenance and cleanliness of the school physical plant. Activity programs to involve parents may appear to be related only indirectly to reading achievement, but they affect such factors as parental classroom visits and teacher morale, which affect reading achievement more directly.

CLASSROOM ATMOSPHERE AND TEACHER ATTRIBUTES

Teacher attributes and general classroom atmosphere are important to reading achievement. As indicated earlier, however, teacher *attitudes* are more significant than their background characteristics. The most effective reading teachers had a

strong sense of personal efficacy in teaching minority children; they believed they could "get through" even to children with shaky motivation or home background.

Their confidence does not mean they ignored the ways their students might be disadvantaged. On the contrary, they were well aware of socioeconomic problems and sometimes used them to motivate their students. For example, at the beginning of the year, one teacher drew bar graphs on the blackboard and indicated where the class placed in reading based on national norms. He then delivered a pep talk to the class. "This is where they say you are (near the bottom of the graph) because you're poor and Black. Can you think of any reason why you should be down here? I can't, and I think you should be up here (close to the mean)." This exercise had a dual purpose: to challenge the students to perform better and to show them exactly what the class goals were in reading achievement. Throughout the year, the teacher and students referred to the graph and assessed their progress. Other teachers were less overt in their efforts to overcome low student motivation and home environment, but were still aware of these as important factors affecting student performance. Some teachers, for example, devised a set of classroom games to improve the self-concept of their students. But whatever technique these teachers chose to deal with the special needs of their students, they remained confident that their teaching would yield positive results.

Another factor found to contribute to improved reading achievement was teacher visits with parents (either in the classroom or at the students' homes). Most teachers who worked to maximize the number of these visits believed they served two purposes. First of all, by meeting with parents, teachers were able to get a better idea of what made their students "tick"—see the relationship between classroom behavior and the students' life outside school. Secondly, these teachers believed that classroom discipline was less of a problem if students knew the teacher was in contact with their parents and that classrooom discipline would be reinforced in the home. This reinforcement, however, was not confined to disciplinary matters; for example, one teacher used letters to parents and an extraordinary number of home visits to encourage parents to read with their children. By the end of the school year, one-third of the parents of this teacher's students were reading regularly with their children.

As these examples illustrate, the successful teachers were willing to expend considerable effort, and the results showed up in the classroom atmosphere they created. Their classrooms were well organized and suffered few disruptions. Students knew what was expected of them, and knew the purpose of each instructional unit. Above all, these teachers were able to challenge and motivate their students by achieving a balance between positive reinforcement and strict discipline.

READING PROGRAM IMPLEMENTATION

Another set of significant variables were related to program implementation. One important factor was the use of school resources for teacher in-service training. The schools in our sample varied in the amount and kind of staff in-service they provided. One school, however, devised a plan that provided consistent, ongoing staff development in a fairly inexpensive way. The school hired a physical education coach who works with all classes at each grade-level for one period a day. During

this time, the teachers at a given grade-level attend staff development sessions conducted by the school's math and reading coordinators. These sessions are oriented to topics and problems that the teachers themselves raise. This type of staff in-service has the advantage of providing regular and practical staff development as well as physical education instruction for students, all at a relatively low cost. (Of course, we found that other programs of staff development also had positive effects on student achievement.)

Another aspect of program implementation is the extent of interaction among classroom teachers. We found that teachers' informal consultations with other teachers about the reading program produced significant advances in students' reading achievement. At some schools this consultation is done on a regular basis and on the teachers' own initiative. At one school, for example, the 6th grade teachers agreed to meet during their lunch hour throughout the first year of the school's Preferred Reading Program. They discussed common problems and exchanged ideas about the modification and adaption of reading program materials. At other schools, interaction among faculty members was built into the schools' in-service program. For example, one set of elementary schools that feed into the same junior high school take turns presenting a classroom demonstration of their reading program, followed by a workshop two weeks later. At least one teacher from each school in the complex attends and then reports back to his or her school. This type of program allows teachers to see how reading instruction is conducted in other schools and, at the same time, facilitates teacher interaction both with a given school and across a number of schools.

Our research also indicates that the more teachers are encouraged to adapt or modify the reading program, the greater is the increase in their students' reading achievement. Teachers modified their schools' reading programs in a variety of ways. For example, a number of teachers prepared written exercises to correspond to a reading program's oral drills, while others used supplementary books and magazines to apply reading lessons in ways relevant to student experience and interest. One aspect of program adaption that several teachers considered important was their effort to get interesting books into the students' homes. Although there was always the chance that some books might not be returned to the school, these teachers believed the payoff from students reading at home, either alone or with their parents, was well worth any lost books.

Our study concluded that, at least with regard to the schools in our sample, no prepackaged reading program or technology will automatically produce effective results. The significant factor is the manner in which individual schools and teachers adapt a particular program to their students' needs. We did find, however, that individualized and diagnostic instruction as a classroom behavior positively affects reading achievement. But again, individualized instruction is a useful technique only to the extent that teachers understand the underlying basis of individualization and actually carry it out effectively. For example, we observed several classrooms using DRP (Development Reading Program), a program designed as individualized instruction. In some of these classrooms, however, the teachers essentially did no more than go through the motions, dispensing a variety of materials and supposedly dividing students into skill-level groupings; it was clear that these teachers did not understand the rationale of the program and were not making adequate distinctions among the skill-levels of their students. On the other hand, we observed other

classrooms where the reading program was primarily oriented toward basal readers, but the teachers were aware of differences among their students, devised individualized materials, and could target their instruction to specific skill-level groupings.

CONCLUSIONS

As noted elsewhere in this report, neither prepackaged reading techniques nor specific teacher background characteristics were among the factors found to contribute to improved reading achievement. Instead, we found that policies enhancing the implementation of whatever reading program the school had selected were effective in raising students' reading scores. The examples presented in this chapter show that individual principals and teachers can approach the task of reading instruction in a variety of ways. No school or classroom maximized all the factors that contribute to reading achievement, but the schools and classrooms discussed in this chapter effectively used some of those factors to enhance their reading programs. In spite of the diversity of approaches and techniques we observed, however, one generalization can be made about the elements of a successful reading program: in practice, these factors reflect a belief on the part of principals and teachers that children can be taught to read, regardless of motivation or background, and that reading instruction can be oriented to the needs of individual students.

Chapter 5

PARENT AND COMMUNITY INVOLVEMENT IN THE SCHOOLS

The past ten years have witnessed increasing parent and community involvement in the schools. Community involvement is seen both as an end in itself, and as a way to affect educational outcomes. Most studies have concentrated on the former view; to date, no studies have demonstrated that community involvement of a certain kind over a prescribed time period affects educational outcomes. Problems encountered in obtaining comparable experimental and control populations, in measuring participation, and in specifying educational outcomes make such studies difficult. As a result, we are left with case-study information that leads us to believe that community involvement in a school is important without knowing exactly *how* it is important.

In this small substudy, with its limited resources, we could not hope to go much beyond previous work in demonstrating the effects of parent and community involvement on educational outcomes—in this case, reading achievement.

Nevertheless, we believed we could obtain a more complete picture or our 20 schools if we analyzed some information about their communities. We therefore conducted a series of about 40 interviews with parents, community residents, agency personnel, and community organization people, collecting information about the role, function, and perceived effectiveness of parents and community members within the schools.[1]

METHODS

A largely open-ended interview schedule was designed to assess the involvement and influence of parents and community groups with the schools, with particular emphasis on reading; and to determine the extent of openness of the school to the community, including activities undertaken by the school to encourage parent and community participation. We strove to make the instrument consistent with community concerns. The instrument was reviewed by community members with experience in program evaluation, who assured the research team that it was both comprehensive and sensitive to community variables.

Interviews were limited to a random subsample of ten schools from the original sample: five each from the Mexican American and Black communities. The schools selected reflected the spectrum of socioeconomic conditions to be found in those coummunities. Interviews were conducted by study team members who were ethnically identified with the respective minority communities included in the study.

[1] A Steering Committee, made up of representatives of each of the ethnic education commissions, advised the research team. This committee consisted of Mrs. Ruby Aguilar, Mexican American Education Commission; Mr. Walter Jones, Black Education Commission; Ms. Ann Mikol, American Indian Education Commission; and Mrs. Nancy Oda, Asian American Education Commission.

Respondents were sought from among parents' groups (both those organized within the school and those outside), community groups who come in contact with the schools, and individual parents and community members known to be active in the schools or in school-related issues. In general, three respondents were interviewed from each school and several others from the community at large. Those interviewed included educational aides, student volunteers, members of community agencies, and district personnel who worked with the schools through the various area offices.[2]

LEVEL OF COMMUNITY INVOLVEMENT

The interview data revealed a pattern of active school solicitation of parent and community involvement. However, certain kinds of parent/community efforts appeared to be much more effective than others. Large school-to-school differences were found in the amount of participation by community and parents. These differences were consistent with the extent to which the school structured its relationship with parents and community to *integrate* them *into* the school and its activities. The level of involvement did not vary as a simple function of neighborhood stability and income level. One of the schools with a lower degree of participation and school/community integration was in a visibly stable neighborhood of single-family homes, while one of the schools with a higher participation and integration level was in a neighborhood which was rapidly changing, and in which there were many multiple unit dwellings, generally crowded housing conditions, and high levels of transiency. It may be more difficult to obtain parent involvement in more transient communities, but the key to such involvement appears to be the leadership both of school administrators and of concerned community residents.

Based on the data obtained from the respondents, and observations of tangible physical and behavioral variables within the schools, a picture of community participation was constructed that is represented by a continuum of school/community integration. Table 5.1 illustrates this continuum, with a range of points from column 1 on the extreme left (a relatively low degree of integration of the community into the school) to column 5 on the extreme right (a relatively high degree of integration). Schools in each subsample were then ranked in terms of level of integration.[3]

The upper row of Table 5.1 represents the various policy stances taken by the schools relative to community involvement. Listed directly below them are examples of activities schools may initiate to carry out those policies.

Columns 1 and 2 represent relatively low levels of school/community integration. The schools that fall into these categories appear to make outreach attempts in a traditional way. Typically, the school develops a program and asks parents to become involved. The midpoint of the continuum (column 3) represents the begin-

[2] Attempts were made to identify a spectrum of opinion in the schools. However, this was not always possible because of the problems presented by respondent identification and selection. Those identified by the school as active are most likely to be proponents. Dissidents, in general, are either not identified or no longer involved with the schools. This raises questions of response bias, which are common to many research efforts that attempt to determine "community" attitudes vis-a-vis some subject. It is also important to recognize that our analysis is based on a small sample of interviews at each school.

[3] The continuum represents only a convenient way to discuss the schools. Since schools upon which the continuum was based were then ranked in terms of the continuum, it should not be considered a test or validation of the approach.

Table 5.1

A CONTINUUM OF SCHOOL/COMMUNITY INTEGRATION

Item	1	2	3	4	5
Policy positions taken by the schools relative to community involvement	Asks for parent involvement	Provides projects for parents	Outreach programs that benefit community (legal, immigration, welfare, etc.)	Space provided for parents in school	Space with equipment or services useful to community apart from school needs
Examples:	Sends notes home (multilingual in non-English-speaking areas)	Asks for help in specific school projects (paper drive, candy sale, Cinco de Mayo festival)	Classes and programs that have no connection to the ongoing school program (special inservice programs)	Parents know where they can use rooms. Offices or a special room for parents/community provided	Parents' room equipped with sewing machines that can be used for personal needs

ning of a broader approach to outreach; these schools provided programs and services for community people as well as parents. Additionally, the school may begin to have visibility in the neighborhood at community functions not directly related to the educational program. Columns 4 and 5 represent still higher levels of outreach and involvement, to the point that the school makes space available to parents and community people. The provision of space appears to foster a feeling of "belonging" among parents and community.[4]

The schools in our subsample were found on all points of this continuum. Almost all the schools had some very active parents—but the numbers of parents and community individuals those parents could in turn mobilize or delegate responsibility to were much smaller at the schools with a lower degree of community involvement than at other schools.

Issues and patterns of involvement varied between the Black and Mexican American subsamples. Different interviewers rated the schools within each subsample; therefore, these findings will be presented separately.

THE BLACK COMMUNITY

Schools

Parents at schools that exhibited low school/community involvement tended to be proud of the school, and expressed fewer concerns about both their own role in school decisionmaking and the competence of the school's staff than was the case at the higher-involvement schools. Characteristically, they spoke of their schools as making certain things available to parents, and tended to rely heavily on the school administration for direction. Community involvement at these schools can best be characterized as passive. The schools' relationship to the Parent Advisory Councils and P.T.A. was supportive and open, but these parents tended to see themselves and

[4] This provision of space (as in categories 4 and 5 on the scale) is modified in our ratings to take into consideration the contingencies of differing amounts of available space among schools. Thus, this category was defined as actual space allotted *or* parents' and community members' perceptions of freedom to move about in the space of the school.

to be seen by the school as tangential to school decisions and activities. Parents were not generally included in school decisionmaking councils.

Column 3 in Table 5.1 represents a midpoint of school/community integration. Schools at this point and higher in the Black communities tended to have parents who had been active and involved with the school for long periods of time—say, over four years. These parents are knowledgeable about the progress of the school, and they are notably able to mobilize others. Although only a few parents may attend any given Advisory Council meeting, they know how to mobilize community interest when an important issue arises. Parents in these schools have begun to articulate their strategies for getting what they want for the school from the Board of Education. The column 3 school in the Black community sponsored a program of community events, and several parents were intent on bringing other community groups into contact with the schools.

In the schools related to columns 4 and 5 in the Black community subsample, parents were in and around the building fairly continuously. They were included on planning and monitoring committees for all school events and activities, not merely those involving compensatory programs or auxiliary services. Although the parents at one school did not have their own room, they were familiar enough with the school's physical plan to be able to find a room in which they could talk with our interviewers in privacy. Attendance at the average Advisory Council meeting was high—about 40 (compared with about 15 at column 1 and 2 schools).

In the Black community school with the most parent/community integration, parents were organized even before the school was established. They were involved from its inception and influenced both the naming of the school and the naming of the Child Care Center. Children's Centers in the Los Angeles Unified School District generally assume the names of the schools at which they are located, but in this case, the community residents strongly felt it should have its own name. This school is distinguished in other ways as well. Classes in sewing, millinery design, and typing are offered to community residents, and the parents have a conference room available to them at all times. The Parent Advisory Council has subcommittees that monitor such disparate subjects as curriculum, employment of school staff, and physical plant maintenance. Attendance at the Parent Advisory Council meetings was reported to average around 50.

Types of Parent and Community Involvement in the Black Communities

Nonparents appear to be involved significantly only in the schools scoring moderate and high in community integration. In the most highly integrated schools (columns 4 and 5), there appears to be substantial involvement by students of local universities, as well as active involvement by nonparent neighborhood residents. In both schools there is a senior citizens group of volunteers, and in all three an open environment for volunteer activities.

Involvement with reading was generally low in all schools. In most cases, the staff selected the reading program and sought approval of the Advisory Council. In some schools parents were asked to approve a *fait accompli* while in others alternative programs were presented but the prior preference or selection of teachers was made clear. In only one school, the one ranking highest in community integration,

did it appear that the parents were objectively educated as to the merits and drawbacks of each program and allowed to make their own informed decision. Teachers participated in this process, so the two groups were essentially acting as equals in the decisionmaking process.

THE MEXICAN AMERICAN COMMUNITY

Schools

The two schools in the Mexican American subsample at the lowest level (column 1) of school/community integration attempted to interest parents by sending home notes encouraging the parents to visit the schools, but did not suggest specific roles for the parents. There was no school-wide policy on the role of parents in the classrooms; it was left up to the parent to discover whether a particular classroom teacher was receptive to his or her presence. As in the Black schools with low levels of community/school integration, parent participation was characterized by low levels of awareness of possible parent roles and school issues. Attendance at parent meetings was low, and the few active parents in the school seemed at a loss as to how to interest more parents. In one school, respondents felt the school was doing all it could to involve parents; in the other school there was a strong feeling that the school could be doing more. Neither of these schools enjoyed any significant level of involvement by community groups.

Three of the five schools in the Mexican American subsample were relatively high in school/community integration (columns 3, 4 and 5, respectively). In these schools there was active participation by community agencies and groups and increased visibility of parents at the school. These schools provided services of a nonschool-related nature aimed at community concerns: workshops on immigration, legal services, and welfare rights, among others. These workshops brought in members of the community at large and created an image of the school as a community resource center. Two of these schools provided physical space for parents and parent projects. These parents' rooms functioned as an integrative mechanism, actively involving those who might otherwise be reluctant to participate because they did not view such participation as appropriate, or because of embarrassment at not speaking English. The existence of on-going projects that used the special skills of the parents helped them to define their roles in the school.

One school (column 5) had gone beyond providing space and parent projects. In this school, sewing machines had been purchased and parents were encouraged to use them for personal needs or to help make clothing for needy members of the community.

While certain issues and cultural characteristics may bring together members of the Mexican American community, these same factors, if neglected, may create barriers to successful school-community relations. One example is language, often an obstacle in the school/community relationship. Many monolingual Spanish-speaking parents are active and make up a significant number of the parents on Parent Advisory Councils, yet they may not make informed decisions. Meetings are conducted in English and often are not translated because parents may be embarrassed to admit that they do not understand English. Or, translation may only

outline the proceedings, and parents may not trust the translator. This problem is so pervasive that the *level of awareness of monolingual Spanish-speaking* parents can often be used as a gauge of the *overall* parent awareness in these schools. If monolingual Spanish-speaking parents are well apprised of the issues in their schools, it is likely that the school is making a sincere effort to communicate with the community and respond to its needs.

Types of Parent and Community Involvement in the Mexican American Communities

In the Mexican American schools, parents were involved as teacher helpers, classroom aides, and noon aides, and worked on special projects. In all of the schools, there was some paid parent training tied to government sponsored educational programs, which drew some parents into the school. They also participated by sitting on the Parent Advisory Council, P.T.A., or various special programs' councils (e.g., Follow Through, Early Childhood Education). In one school, parents were invited to give workshops or classes on special skills they possessed. They sometimes functioned as representatives of the school at city-wide and district-wide meetings. In the schools with the highest levels of community integration, parents participated by availing themselves of services provided by the school.

The involvement of nonparent, community-based groups in the schools was an important discriminator between schools with lower and higher levels of integration. In the East Los Angeles area, community, high school, and university-affiliated groups have played a significant role in the schools. One organization based in the East Los Angeles area has been responsible for training community members in techniques for organizing parents in schools. Four of the five schools in the Mexican American subsample were recipients of the services of this organization. The schools that had parent workshops sponsored by the organization were those that ranked at the higher levels of community/school integration.

An organization affiliated with a local university had presented weekly programs aimed at ethnic identity and personal growth in several of the 6th grade classrooms in the three most highly integrated schools in the sample.

While it is difficult to state whether high levels of school/community integration caused a school to have significant participation by community groups, or whether the higher levels of community participation was a cause of a strengthened school/community relationship, it is important to note that the two factors correlated. The existence of nonparent, community-based groups in the schools was an important discriminator between low (column 1) and higher (column 3 and above) schools.

FACTORS IMPORTANT IN SCHOOL COMMUNITY RELATIONS

High levels of parent and community activity did not necessarily mean that parents were effective in setting and achieving goals. Those schools with low levels of school/community integration were characterized by few, if any, demands by the community. However, even in some schools with relatively high community involvement and activity, parents could not remember actually having made a demand on

the school, and there was relatively little awareness of how to go about making changes or expressing demands. In the schools where persons were most able to point to parent-initiated or community-initiated accomplishments, the respondents more readily related minor dissatisfactions and had a sense that they could create a climate of productive tension until they got what they wanted. There was a great deal of awareness in these schools (basically, 4 and 5 on the scale) of the administrative hierarchy, all the way up to the Board of Education. Several of the parents in these communities had dealt with school administrators at various levels in order to gain satisfaction on an issue of concern to the community. High parent/community efficacy in all the schools surveyed was characterized by a high level of awareness of school/community issues, familiarity with methods for obtaining satisfaction that transcended the immediate school setting, and the ability to generate productive tension within the school in order to ensure that parent/community concerns were acted upon. In schools where parent efficacy appeared to be low, tensions were played down and parents exhibited relatively little awareness of alternatives for effecting change.

The role of the principal was repeatedly stressed as important in establishing a climate for school/community relations. In two schools, the principal's leadership was cited as the impetus for community representation on school committees, including employment screening and the selection of the reading program to be used. In these schools, the principal took an active stance not only in involving the parents, but in educating them so that they could make informed choices. As a result, parents backed the principal to the hilt, even to the extent of going to the Board of Education to push for the favorable resolution of issues perceived to affect the interest of the school. In the schools characterized by active principal/community relations, parents appeared to regard the school as theirs, largely open to their input, and education was seen as the joint responsibility of the parents and school staff. In the schools with less active principal/community relations, there had been one or more changes of principal in recent years, and it was sometimes the case that the new principal was struggling to transform relative apathy into community involvement—or had difficulty in maintaining a previously established high level of commitment.

COMMUNITY INVOLVEMENT AND READING GAINS

While community involvement has intrinsic value, the specific relationship between community involvement and reading scores is also of concern. It does not necessarily follow that a high level of school involvement by both community and parents will influence reading achievement. To roughly assess the relationship between parent involvement and student gain, we ordered schools in our community subsample according to both their perceived levels of community involvement and their percentile gains in reading achievement from grades 4 to 6, and compared the rank-orderings (see Table 5.2). These orderings suggest that for Black schools, levels of parent involvement appear to relate rather closely to student reading gains, an observation consistent with the results of our statistical analysis (Chap. 3), which found that high levels of teacher-parent contact were associated with reading gains. No such relationship appears in the Mexican American subsample, although it

Table 5.2

RANK ORDERING ON LEVEL OF COMMUNITY INVOLVEMENT AND READING GAINS[a]

Black Community Subsample			Mexican American Community Subsample		
School	Community Involvement[b]	Reading Score Gain	School	Community Involvement	Reading Score Gain
B	5	+5	S	5	-2
E	4	(c)	F	4	-18
J	3	-3	P	3	-7
M	2	-4	C	1.5[d]	-5
I	1	-11	D	1.5[d]	-6

[a]Grades 4 to 6 mean percentile gains.

[b]The highest rank is 5.

[c]Gain scores at this school were judged invalid because of test exposure problems. Since this school was eliminated from the analysis in Chap. 2, we have eliminated the gain score from this table. However, the pattern of community variables for this school was consistent with the findings for other schools in the Black subsample.

[d]Tied ranking.

should be noted that the school that was most effective in that subsample, if not in producing reading gains, then in holding back losses, was also the school with the highest level of community/school integration and awareness among monolingual Spanish-speaking parents. This of course does not explain the absence of a relationship between reading scores and school/community integration rankings in the remaining schools in the sample.

On the basis of the data we collected and our experience in related research, we can speculate on some possible reasons for the apparent relationship between parent and community involvement and student reading gains in the Black sample, and the lack of such a relationship in the Mexican American sample. We noted earlier that level of parent/community activity cannot be equated with efficacy in influencing reading achievement. This is particularly so in Mexican American communities. Language (and other factors) may be creating barriers to parent/community effectiveness; we may well be observing parallel processes in the classroom and community. In addition, the immediate needs of the community may at times be more salient than the specific concerns of classroom instruction. Outreach programs that offer services may increase the level of school/community integration and benefit participants without strongly affecting educational programs or outcomes.

Outreach programs in the Black communities that provide services are less likely to be the initial attraction for parent involvement in the schools. Such programs increase the level of school/community integration and help to meet community needs and concerns but are more likely to include an educational orientation.

We say little about causality, of course. At the same time, the pattern of findings presents some implications for policy. It appears that in Black communities, level of involvement in the schools may be related to reading gains. No such relationship was found in the Mexican American communities. The mixed pattern of effect in our sample of Mexican American schools suggests the possibility of more complex relationships that are obscured by the presence of variables we did not measure. It is the judgment of the interviewers that if community needs and processes were better understood, a relationship between level of involvement and gains might be found in Mexican American as well as Black communities. We believe that parent-community involvement should continue to be strongly encouraged in both communities and that further efforts to clarify the relationships in the Mexican American community should be considered.

Chapter 6

CONCLUSIONS

OVERALL ASSESSMENT

In general, our findings confirm the appropriateness of the current district reading program policies of school-level goal setting, teacher involvement in program planning, and the allocation of important decisionmaking authority to schools and teachers. We found that for both Black and Mexican American students, school and classroom inputs were directly responsible for significant changes in students' reading achievement. In other words, school and classroom decisions matter for the education of the minority students we studied, over and above the importance of student background characteristics such as socioeconomic status and prior reading knowledge.

We also identified specific classroom and school factors that were related to reading achievement in our sample of Black children, though the strength of these findings depends on assumptions about the validity of test results arising from evidence of test exposure. We were unable to identify specific school or programmatic factors related to the real gains we discovered for Mexican American children, even though the evidence is clear that school and classroom inputs do in fact matter for the Mexican American sample.

Our limited analysis of the effects of parent and community involvement on education leads us to believe that such involvement should be encouraged. Although our findings are only suggestive, it appears that vigorous school efforts to involve the community are often associated with improved outcomes for children's education.

The following discussion details this overall assessment by summarizing the specific findings for our sample. We then consider the applicability of these findings to other schools and to future policies.

SUMMARY OF FINDINGS

Reliability of Test Results

Reliability analysis is performed to assess whether test results are internally consistent and reasonably free from random errors and other inaccuracies. We found solid evidence in our data that the reading tests used by the LAUSD meet established reliability standards. Reliabilities were high for both the large sample of student records we analyzed, and for each school.

Validity of Test Results

Our analysis of test validity is relevant both to the interpretation of our findings on effective school policies and to the district's methods of assessing school-by-school changes in reading achievement. Our first point concerns the way that reading gains

are measured. The current policy is to report cross-sectional change, that is, to compare different groups of students from one year to the next. But year-to-year differences can be largely due to differences in the ability and composition of successive groups of students and therefore are not a truly valid measure of improvement. To test this, we compared changes in successive 6th grade median scores (the district's measure) with changes in individual children's scores over time, and found only a moderate rank order correlation. To assess true change, we must compare the performance of the same group of students between, say, 1974 and 1975 as they passed through the 5th and 6th grades. For that reason, we recommend that the district consider the use of longitudinal cohort analysis like the one performed for this study. This involves collecting and reporting data on the progress of individual students over time, rather than grade level data on successive cohorts.

Our second set of comments concerns test preparation. Used appropriately, test preparation enhances the validity of test scores and allows meaningful cross-school and cross-classroom comparisons. However, overzealous test preparation can produce invalid scores and mask failures to educate. Our findings indicate that the level and range of test preparation activity varied widely. Many teachers reported considerable pressure to show test score gains, and few saw much utility in test scores as indicators of students' performance. This combination creates an environment that is ripe for overzealous preparation. Exposure of children to tests or at least intensive drilling on material likely to be covered on upcoming tests can—and we believe sometimes did—occur in a few classrooms. We emphasize, however, that for about 90 percent of the teachers we surveyed no such questions as to the validity of measured gains are warranted.

Effect of School and Classroom Factors on Reading Achievement

Students who had similar backgrounds and prior achievement levels, but who had different school and classroom experiences, achieved different rates of reading progress. That is, some schools and some classrooms within a school contributed more to their student's achievement than did others. This result held for both Mexican American and Black children, and did not change when we excluded test outcome data that may have been spurious as a result of test exposure.

We infer that school and classroom effects on reading progress were strong because very different kinds of influences—school policies and classroom settings—were received by children depending on where they were enrolled. This finding lends support to district policy, which grants authority and resources to local schools to design and operate reading programs.

We also found that at both predominantly Black and Mexican American schools, *principals can make highly accurate assessments of the instructional ability of their teachers.* This suggests that principals are indeed an appropriate locus for school-level instructional policy decisions, at least in our 20 schools.

As we discuss below, there are no fixed programs or single strategies that can raise reading scores all at once. But it does appear that reading instruction can be improved on a school-by-school and classroom-by-classroom basis when individual programs are carefully planned, adapted to local circumstances, and implemented effectively.

Factors Affecting Reading Achievement for Black Children

On the basis of our analysis we conclude that *three broad categories of factors produce improved reading achievement for Black children: program content, implementation strategies, and classroom atmosphere.* These relationships were strong, and remained consistent even when we excluded test scores for classrooms where there was strong evidence of prior test exposure. When we further excluded test scores for additional classrooms showing unusually large gains, some of the associations we report here became weaker. Confidence in the soundness of our results must therefore be tempered by the reader's judgment about how much test exposure actually occurred. We believe that the middle-ground position we used in generating the results we report here is at least reasonable.

We found that *reading achievement improved when the reading program used varied materials for different students at the same time.* Other more novel approaches to instruction, such as open classrooms and team teaching, were not consistently related to measured gains on standardized reading tests. Our analysis of other program content measures also supported the conclusion that *reading curricula do not, by themselves, determine the success or failure of a school's reading program.* In fact, there is wide variation in average student progress among classrooms that have very similar curricula and reading strategies. This may imply that any of the reading programs we studied *can* be effective depending on how well it is implemented and taught. Principals may wish to consider whether an effective program of individualization—such as the one measured by our "use of varied materials" question—can be appropriately used in their schools, as well as the question of how such a program could be implemented. Additional teacher training, and visits by resource staff to individual classrooms to observe and suggest activities that will strengthen teachers' use of individualized techniques, may be useful in pursuing this goal.

We found that *program implementation affects reading achievement across a range of instructional methods and school settings.* The implementation strategies chosen by a school to support its reading program are crucial, because *how* a reading program is carried out strongly affects how much students learn. The importance of implementation strategies is very great even after taking into account the impact of curriculum, classroom setting, and teacher attributes. Successful implementation strategies in our sample included adequate teacher training (especially with respect to the use of varied materials), a high level of informal consultation among staff, and freedom on the part of teachers to make modifications in the reading program that increase its pertinence to the practical situations they encounter in their classrooms. In general, the more active was the role of teachers in implementing the reading program, the more reading achievement improved.

Classroom atmosphere factors that affected reading included an absence of disruption, frequent contact between teachers and parents, and a feeling of efficacy on the part of teachers. Our measurements of the classroom setting are not subtle, but they confirm the hypothesis that the background for learning can affect teachers' and students' productivity. Moreover, we found that teachers matter for reading: their sense of being able to "get through" to students, their commitment and morale, help to determine how much children learn. We were surprised to find little or no association between teachers' background attributes and reading progress in their classrooms. Years of experience, ethnicity, college major, or place where the undergraduate degree was obtained appeared to have little influence.

Policies that strengthen teachers' commitment and provide them with the skills and resources necessary for them to perform well in difficult circumstances may contribute to improved classroom settings, and thus to improved reading achievement.

As an illustration of the quantitative importance of the various specific factors that we have identified as important, we estimate that exposing the average student in our sample to all of the approaches found to be effective would have resulted in a 10 to 20 point percentile gain for that student over the course of the 6th grade, instead of the decline of 3 percentile points that actually occurred.

As we stated earlier, our analysis demonstrated that principals' assessments of teachers accurately predict how much students will gain in reading. While it is likely that parents and teachers also have valuable information about school problems, the principal has a unique opportunity to observe the whole situation at his or her school, and to act to improve it. Principals can exercise their leadership in a number of ways that may help produce reading gains, by observing teachers and making specific recommendations for change. Principals can facilitate successful program implementation by working to provide adequate training for teachers, and they can encourage teachers to consult with each other and to modify their programs to meet their students' needs more fully.

For the predominantly Black schools in our sample, high levels of parent and community involvement appeared to be associated with better reading outcomes. Although our study of this relationship was constrained by resource limitations, and although no similar finding was derived for Mexican American schools, we suggest that the current district policy is sound in encouraging schools to involve the community in the educational process.

In summing up our substantive findings, it is important to emphasize that *no single school or classroom factor, taken by itself, is likely to produce large increases in reading achievement.* We found many school and classroom factors that were strongly related to reading performance, but no one factor or small group of factors dominated our findings. We believe this is to be expected. Reading instruction is far too complex to allow for simple policies or "quick fixes."

Our findings suggest that continuation of the district's policy of school-level goal-setting for reading, and delegation of authority to schools and teachers to make program planning and implementation decisions, is appropriate for the sample of selected schools.

APPLICABILITY OF THE FINDINGS TO OTHER SCHOOLS AND FUTURE POLICIES

In considering the degree to which our findings may be applicable to other educational settings, we must repeat the caveats we have stressed in this report: we worked with a nonrandom sample of predominantly Black and Mexican American schools in Los Angeles, and studied intensively only what occurred in the 6th grade in those schools. Consequently, generalizations to other minority schools, to predominantly Anglo schools, to other districts, and to other grade levels can be only suggestive.

With those caveats in mind, we offer the following policies as general guidelines:

- Because our analysis illuminated the importance of particular schools and classrooms within schools for reading progress, a good measure of local school autonomy seems warranted, particularly in large districts. This suggestion is bolstered by the conformity of our results to previous research in the field *and* by our finding that principals we queried have accurate knowledge of their teachers' relative effectiveness in the classroom.
- Though the specific factors we identified as efficacious were associated only with reading gains for Black students, they too are confirmed by other research on both majority and minority schools. Teacher flexibility, individualized approaches, teacher-to-teacher consultation, training and morale enhancement for teachers, and involvement of parents and community members in the educational process all appear to have payoffs—and all point again toward the desirability of school-level decisionmaking.
- Therefore, the national trend we observe toward central direction in school districts may not be very productive, at least for large, complex school systems.

To the extent permitted by local resources, school district research staff should attempt to replicate and extend the findings of this limited study, and should pursue issues that we were unable to resolve adequately. These include: the utility of standardized tests for gauging reading achievement, the relevance of national norm criteria to minority children, the consequences of the growing emphasis on test scores as measures of success, and the factors associated with true reading achievement for students from non-English-speaking backgrounds. Further research of this kind is likely to provide useful information for policy decisions.

Appendix A

SAMPLE DESIGN AND DATA COLLECTION

This appendix describes various technical aspects of the study performed. We first outline the procedures used to select the elementary schools included in our sample. We then discuss how we traced students from the 6th grade classes of 1974 and 1975 to the junior high schools they attended in February and March 1976 where their cumulative records were lodged, and the extent to which the sample of students for whom data were obtained are representative of the population of 6th grade students in the selected elementary schools. We also describe the methods we used to collect data on school and classroom factors.

SELECTION OF THE SAMPLE ELEMENTARY SCHOOLS

Criteria Used

The criteria used in selecting the 20 sample schools were that each school should demonstrate substantial or consistent test score gains, a predominantly minority enrollment, and enough 6th grade classrooms to exhibit variation in reading approach, and that each should serve a population that is low in socioeconomic status.

The LAUSD's Request for Proposal criteria for the sample schools were that each should have a predominantly minority enrollment and substantial and consistent test score gains on the 6th grade reading test. These criteria relate to the purpose of the study, which was to identify those elements of the reading program that improved reading achievement in minority schools.

To further define an appropriate population, Rand added two more criteria. Some schools are extremely small (for example, Solano), with only one or two classrooms at each grade level; the school-size criterion was formulated to ensure a sufficient sample of students from each school so that we could measure variation in school-determined aspects of the reading program. In addition, a few predominantly minority schools serve populations of relatively high socioeconomic status (for example, Windsor Hills). Because children there were expected to outperform minority children elsewhere, we added a criterion for socioeconomic status.

To quantify these criteria, we used the following definitions:

Substantial Gains: An increase in the 6th grade class total reading test score median (national norm percentile for the school) of 15 or more percentile points from Fall 1972 to Spring 1975. Schools with substantial gains were not required to have consistent gains.

Consistent Gains: No gain in any one intermediate year greater than two-thirds of the total gain, Fall 1972 to Spring 1975.

Minority Enrollment: At least 60 percent nonwhite enrollment, Fall 1972, and at least 80 percent nonwhite enrollment, Fall 1974. (Nonwhite enrollment includes Black, Mexican American, Native American, Asian American, Filipino, and other.)

No school was to be selected that derived more than one-half its minority enrollment from the Asian American population. (This limitation was included because Asian Americans normally have higher achievement levels.)

School Size: Enrollment of at least 400.

Socioeconomic Status: Title I rank of 200 or lower. Of the district's 436 elementary schools, ranks 1 to 200 represent the "most disadvantaged" schools. The Title I rank is based on AFDC (Aid to Families with Dependent Children), free lunch program participation, the distribution of family income in the 1970 Census of Population, and the distribution of assessed values for single-family residential properties.

To select the schools, we first identified the 200 that qualified on the basis of socioeconomic status. We then reduced this list by the school-size and minority enrollment criteria, which left 87 schools for consideration. The test-score changes (5th grade to 6th grade) were examined for all of these schools, and the 8 schools with substantial gains (15 or more percentile points) were selected for the sample. (These schools did not necessarily have consistent test score changes.) We also identified 19 schools that registered consistent test-score changes, and divided them into two groups: those with less than a 10 percentile point gain and those with gains of between 10 and 14 percentile points. We selected 6 schools from each group, so as to maintain a balance in the sample between predominantly Black and predominantly Mexican American schools. Table A.1 presents the sample schools and their values on each of the selection criteria.

Comparison of the Sample Schools with All LAUSD Schools

In comparison with all LAUSD schools, the 20 sample schools have a higher percentage of minority students, larger size, lower socioeconomic status, and larger gains on 6th grade reading test scores. (See Table A.2.)

Although the sample schools were constrained by study objectives to have at least 80 percent minority enrollment, the ratio between Black and Mexican American students in the sample is the same as their ratio in the district. Asian American and Native American students, however, are not represented in the sample in proportion to their ethnic distribution in the school district. The two schools with the highest proportions of Asian Americans were excluded from the sample. Castelar was excluded because its enrollment was more than 50 percent Asian American; Coliseum Street, which has an Asian American enrollment of 46 percent, was excluded because its Title I rank was greater than 200. The two schools with the largest shares of Native Americans (Park and Woodlawn) have more than 20 percent nonminority enrollments.

Because the sample schools had to have at least 400 students, they are 70 percent larger on average than other district schools. There were 146 schools in the district smaller than the smallest school (enrollment of 591) in the sample.

The district-wide gain in median national norm percentiles on the reading test for 6th grade between 1972 and 1975 was 5 percentile points, or 15 percent of the base-year score. The sample schools, which had a considerably lower mean score in 1972, had increased their scores during the period of the study to the extent that their mean score was closer to the district median by 1975.

Sample schools were lower in socioeconomic status than the mean for the dis-

Table A.1

Selected Characteristics of Sample Schools

School	6th Grade Total Reading Test Scores[a]				Test Score Change			Total Gain	Title I Rank[b]	Ethnic Distribution (%)[c]						Enrollment
										1972			1974			
	Fall 1972	Fall 1973	Spring 1974	Spring 1975	1972-73	1973-74	1974-75			Black	Mexican American	Other Minority	Black	Mexican American	Other Minority	
Alta Loma	15	17	19	23	2	2	4	8	105	92.3	5.4	7.4	90.9	6.5	1.6	856
Angeles Mesa	17	18	24	31	1	6	7	14	106	97.7	1.5	0.4	97.5	0.1	1.9	936
Ascot Avenue	11	14	17	43	3	3	26	32	14	97.9	1.5	0	96.2	3.5	0	772
Dacotah Street	20	25	26	28	5	1	2	8	103	1.3	87.0	4.1	0.9	91.7	3.2	1020
Eastman Avenue	18	19	24	36	1	5	12	18	91	0.1	97.4	0.3	0	98.0	0.3	1462
Ford Boulevard	15	20	22	27	5	2	5	12	57	0	97.3	0	0	98.0	0.1	1338
Harrison	15	23	21	31	8	−2	10	16	64	0.8	97.6	0	0.1	98.0	0.7	686
Hillside	16	22	22	28	6	0	6	12	60	0.2	93.2	3.9	0.5	88.5	7.3	591
Manhattan Place	24	27	27	30	3	0	3	6	159	98.9	0.3	0.4	99.2	0.5	0	974
McKinley Avenue	14	14	18	25	0	4	7	11	28	98.1	1.6	0.1	98.8	1.2	0	758
Miller	11	15	21	33	4	6	12	22	50	98.8	0.9	0.3	92.2	1.9	0.3	1153
118th Street	12	15	19	33	3	4	14	21	26	95.7	4.1	0.1	97.6	1.6	0.3	668
112th Street	9	8	13	18	−1	5	5	9	11	99.7	0.3	0	99.6	0.2	0	837
Pacoima	12	15	18	22	3	3	4	10	61	53.6	42.7	0.4	45.3	52.8	0.2	1440
Rosemont Avenue	28	25	52	62	−3	27	10	34	145	7.0	58.7[d]	23.6	6.1	56.9[d]	28.2	1096
Rowan Avenue	15	15	21	27	0	6	6	12	83	0.4	96.8	0.9	0.2	98.2	0.3	1410
Sierra Park	24	26	28	30	2	2	2	6	150	0.5	86.8	4.0	0.7	87.6	4.5	1223
10th Street	11	15	25	31	4	10	6	20	102	0.7	89.8	4.8	0.3	94.3	2.6	1148
28th Street	11	13	17	18	2	4	1	7	43	51.8	42.5	4.5	40.8	55.6	3.0	995
Vermont Avenue	9	8	11	62	−1	3	51	53	35	69.3	25.6	5.3	59.0	36.1	3.9	1238

[a]National norm median percentile, CTBS-Q2. Source: Hispanic Urban Center.

[b]Of 436 schools, January 1974. Source: Hispanic Urban Center

[c]Source: Racial and Ethnic Survey, Fall 1972, Report No. 327, Measurement and Evaluation Branch LAUSD; Racial and Ethnic Survey, Fall 1974, Report No. 347, Research and Evaluation Branch, LAUSD.

[d]Rosemont Avenue School had an appreciable number of students with Cuban backgrounds who are grouped with the Mexican American children in the Racial and Ethnic survey. In all of the other schools in our sample, virtually all children with Latino backgrounds (classified as Spanish surnamed in the Racial and Ethnic Survey) were of Mexican descent. Rosemont Avenue also has a small enrollment of Filipino students, some of whom have Spanish surnames and may be grouped with the Mexican Americans.

Table A.2

COMPARISON OF SAMPLE SCHOOLS WITH ALL LAUSD SCHOOLS

Characteristic	All Schools	Sample Schools
AFDC Rank, 1974		
Range	1-436	11-159
Mean	218	75
Ethnic Distribution, Fall 1974 (%)		
Black	24.8	41.7
Mexican American	31.8	53.1
Asian American	4.9	2.7
Native American	0.3	0.1
Other	38.2	2.4
Reading test scores, CTBS-Q2, Grade 6[a]		
1972	33	15
1973	33	18
1974	38	22
1975	38	31
Gain, 1972-75	5	16
Enrollment, fall 1974		
Range	146-1641	591-1462
Mean	736	1030

[a]Median national norm percentile for the district, mean of the median national norm percentiles for the sample schools. A median is published for the entire district and for each school for each year. Without the raw data, it is impossible to construct medians for groups of schools; therefore, the mean of the medians for the sample schools is used.

trict. This means that the typical sample school had a Title I rank closer to the most "disadvantaged" and lowest in socioeconomic status than that of the typical school in the district.

Comparison with Minority Schools in the LAUSD

The 20 schools had lower median national norm percentile reading test scores in 1972 than the average school with at least 80 percent minority enrollment. They also had greater gains than the average minority schools, and in 1975 had higher test scores. (See Table A.3.) During this period the 80-percent-minority schools had gains in median national norm percentiles higher than the district's gain for all students.

The sample schools were larger on the average than the typical minority school in the district, and had slightly more Mexican American and fewer Black, Asian, and other ethnic students enrolled than the average minority school. The sample schools had a slightly lower Title I rank than the average minority school in the district. This means that sample schools were slightly lower in socioeconomic status than the average minority school.

Table A.3

COMPARISON OF SAMPLE SCHOOLS WITH ALL 80-PERCENT MINORITY SCHOOLS IN THE LAUSD

Characteristic	All 80-Percent Minority Schools	Sample Schools
AFDC Rank (1974)		
Range	1-396	11-159
Mean	100	75
Ethnic Distribution, Fall 1974 (%)		
Black	50.7	41.7
Mexican American	41.9	53.1
Asian American	3.9	2.7
Native American	0.1	0.1
Other	3.4	2.4
Reading Test Scores, CTBS-Q2, Grade 6[a]		
1972	18	15
1973	19	18
1974	23	22
1975	28	31
Gain, 1972-1975	10	16
Enrollment, Fall 1974		
Range	146-1641	591-1462
Mean	851	1030

[a]Mean of school median national norm percentile. A median is published each year for the district as a whole and for each school in the district. Without the raw data, it is impossible to contruct medians for groups of schools; therefore, the mean of the school medians is used.

DATA COLLECTION

Student Cumulative Records

To collect historical data on the 1974 and 1975 graduates of the 20 schools, it was necessary to locate their elementary cumulative record folders at the students' current junior high schools. At the completion of 6th grade, the elementary school records are sent to the junior high school where the student is expected to enroll the following year. If the student does not, the records may be returned to the elementary school, or sent to another junior high school that requests the records, or filed in an inactive file. Records are sent to other California school districts when requested by the receiving schools for transferring students.

To identify the junior high schools that the graduates of our 20 schools would be expected to attend, we used the Contributing Schools Report (prepared each fall by the Maps and Boundaries Section, Educational Housing Branch, School Building Planning Division) and the Permits with Transportation (PWT) Statistical Information Report (prepared by the Permits with Transportation Office). The Contributing Schools Report identifies the elementary schools that contribute to each junior high

school. The junior high schools identified as receiving schools for our 20 schools are listed in Table A.4. Most of these schools are sending schools in the Permits with Transportation Program (PWT); that is, some of their students are transferred to other junior high schools. (Table A.5 is a list of the receiving PWT junior high schools for each sending junior high school in Table A.4.) The Permits with Transportation Program was designed to relieve crowding in inner city schools and to meet earthquake safety standards by transferring students by bus to less crowded, new schools.

The junior high schools listed in the Contributing Schools Report were reviewed to ensure that a substantial proportion of each graduating class could be expected to be found. After data collection activities were conducted at each junior high school, the number of records found from each elementary school was compared with the number expected. If the number of records found was significantly less than expected, the PWT schools for that junior high school were checked and added to the data collection schedule if the school had enrolled a reasonable number of students from the elementary school in question. This process continued throughout the period of data collection activity to ensure that an adequate number of cases from each school were located. Table A.6 lists 6th grade sizes and numbers of cases for the 20 sample schools.

We identified 37 receiving junior high schools where graduates of the 20 sample schools were expected to matriculate. We collected data at 32 of these schools,

Table A.4

RECEIVING JUNIOR HIGH SCHOOLS FOR SAMPLE ELEMENTARY SCHOOLS

School Name	School Name
Adams	Hughes[a,c]
Audubon	King
Belvedere	Maclay
Berendo	Mann
Bethune	Markham
Burbank[a]	Mount Vernon
Burroughs[b]	Muir
Carver	Nightingale
Clay	Nobel[a, c]
Drew	Pacoima
Edison	Pasteur
El Sereno	Portola[c]
Foshay	Revere[c]
Fulton[a,c]	San Fernando
Gage[c]	Sepulveda[a,c]
Gompers	Stevenson
Griffith	Virgil
Harte	Webster[d]
Hollenbeck	

[a]Receiving junior high school, class of 1975 only.

[b]Receiving junior high school, class of 1974 only.

[c]Not sending school in the PWT program.

[d]Both sending and receiving school in PWT program.

Table A.5

"PERMITS WITH TRANSPORTATION" JUNIOR HIGH SCHOOLS, 1975

Sending School	Receiving School	No. of Pupils
Adams	Fulton	1
	Holmes	2
	Revere	2
Audubon	Bancroft	2
	Columbus	3
	Emerson	40
	Henry	3
	Holmes	3
	Hughes	2
	Madison	6
	Millikan	2
	Nobel	5
	Palms	3
	Revere	86
	Sutter	3
Belvedere	Portola	37
Berendo	Bancroft	1
	Holmes	3
	Hughes	1
	Reed	115
	Sequoia	14
Bethune	Emerson	2
	Fulton	6
	Holmes	2
	Hughes	1
	Madison	3
	Nobel	2
	Parkman	1
	Sepulveda	14
	Sequoia	6
Burbank	Millikan	2
Burroughs	Bancroft	1
	Emerson	2
	Madison	1
	Palms	2
	Revere	1
Carver	Bancroft	16
	Columbus	1
	Emerson	12
	Fulton	2
	Henry	1
	Madison	3
	Revere	29
	Sepulveda	13
Clay	Carnegie	14
	Emerson	4
	Fleming	2
	Fulton	1
	Holmes	2
	Hughes	15
	Madison	8
	Northridge	4
	Parkman	6
	Porter	4
	Revere	2
	Sepulveda	4
	Sequoia	1
	Sutter	1
	Van Nuys	3
	White	4
	Wright	3
Drew	Madison	5
	Mulholland	1
	Parkman	3
	Revere	2
Edison	Bancroft	5
	Emerson	9
	Madison	7
	Millikan	1
	Mulholland	1
	Parkman	1
	Revere	5
El Sereno	Millikan	3
	Portola	21
Foshay	Carnegie	7
	Columbus	7
	Emerson	9
	Henry	3
	Holmes	8
	Hughes	1
	Madison	1
	Millikan	2
	Nobel	2
	Northridge	2
	Porter	36
	Revere	2
	Sequoia	7
Gompers	Dana	8
	Emerson	2
	Fleming	15
	Madison	4
	Revere	6
	Sepulveda	4
	White	14
Griffith	Portola	70

Table A.5 (CONTINUED)

Sending School	Receiving School	No. of Pupils
Harte	Carnegie	17
	Fleming	17
	Fulton	109
	Holmes	5
	Hughes	4
	Madison	14
	Mulholland	81
	Northridge	64
	Parkman	81
	Reed	1
	Revere	4
	Sepulveda	99
	Sequoia	43
	Van Nuys	46
	White	58
	Wright	9
Hollenbeck	Portola	6
King	Millikan	17
Maclay	Portola	1
	Van Nuys	16
Mann	Carnegie	1
	Emerson	21
	Fulton	1
	Henry	1
	Holmes	121
	Hughes	131
	Madison	53
	Millikan	1
	Mulholland	1
	Nobel	117
	Northridge	5
	Parkman	2
	Porter	1
	Revere	29
	Sepulveda	2
	Sequoia	3
	Sutter	104
	Wright	24
Markham	Carnegie	1
	Emerson	2
	Fleming	1
	Fulton	1
	Holmes	2
	Mulholland	2
	Revere	2
	White	1
Mt. Vernon	Bancroft	1
	Carnegie	2
	Emerson	22
	Frost	39
	Henry	46
	Holmes	4
	Madison	1
	Millikan	21
	Nobel	1
	Palms	20
	Porter	3
	Reed	4
	Revere	33
	Sequoia	1
Muir	Bancroft	1
	Emerson	15
	Henry	1
	Holmes	12
	Hughes	1
	Le Conte	15
	Madison	16
	Mulholland	2
	Nobel	2
	Palms	1
	Reed	1
	Revere	2
	Sepulveda	3
	Sutter	1
	Van Nuys	5
	Wright	1
Nightingale	Millikan	14
Pacoima	Portola	1
Pasteur	Bancroft	26
	Carnegie	1
	Columbus	1
	Emerson	22
	Henry	5
	Palms	36
	Porter	8
	Revere	36
	Sepulveda	2
San Fernando	Portola	1
Stevenson	Portola	4
Virgil	Millikan	121
	Reed	2
Webster	Palms	2

Table A.6

SIZE OF 6TH GRADE BY SCHOOL AND CASES IN STUDY, CLASSES OF 1974 AND 1975

School	1974 Size of 6th Grade	1974 Cases	1974 % of Class	1975 Size of 6th Grade	1975 Cases	1975 % of Class
Alta Loma	125	82	66	110	88	80
Angeles Mesa	152	104	68	117	89	76
Ascot Avenue	114	90	79	103	93	90
Dacotah Street	113	80	71	98	76	78
Eastman Avenue	176	146	83	171	152	89
Ford Boulevard	153	109	71	99	75	76
Harrison	86	66	77	74	65	88
Hillside	72	58	80	77	61	79
Manhattan Place	148	92	62	164	119	72
McKinley Avenue	115	95	83	106	72	68
Miller	153	113	74	114	88	77
118th Street	93	60	64	90	71	79
112th Street	109	76	70	89	71	80
Pacoima	189	121	64	183	154	84
Rosemont Avenue	144	88	61	121	103	85
Rowan Avenue	162	146	90	179	146	82
Sierra Park	157	141	90	163	145	89
10th Street	146	116	79	138	125	90
28th Street	133	93	70	122	95	78
Vermont Avenue	126	110	87	124	102	82
Total	2666	2666	74	2442	1990	81

including 4 that received students in the PWT program. The aim was to find records for at least 80 percent of each graduating class. Initially, 27 schools were scheduled for data collection; 5 more were scheduled to increase the proportion of records found from the 20 sample schools. Table A.7 describes the kinds of information collected in the 20 schools; Table A.8 and A.9 present the number of records located at the junior high schools for the Classes of 1974 and 1975.

The data items recorded on prepared coding forms from the cumulative record files located in the junior high schools were:

- Elementary school attended
- Student's name (for coding verification; student identification by name has *not* been retained in our data files)
- Sex
- Ethnic background (as determined from name, birthplace, parent's photo, and language spoken in the home)
- Presence of parents in the home (from listing of guardians, step-parents, comparison of student's and parents' names and person responsible)
- Parents' occupations
- 1st grade reading test score (Cooperative Primary) (Class of 1975 only)
- 3d grade reading test score (Stanford or Cooperative Primary)
- 4th grade Spring reading test score (CTBS-Q2 or R2)

Table A.7

DESCRIPTIONS OF DATA COLLECTED IN THE 20 ELEMENTARY SCHOOLS

Information	Source of Information	Examples
School Data Sheet	Principal/Office Manager	Enrollment, turnover, specialists, aides
Principal interview	Principal	Activities to support program implementation; teacher reactions to program; community involvement; reasons for reading gains; problems encountered in implementation
Principal assessment of teacher skills	Principal	Use of management system; combining teaching of skills and comprehension; maintaining reasonable discipline
Reading Coordinator interview	Reading Coordinator or equivalent	Components of reading program; successful instructional techniques; community involvement; problems encountered in implementation
Teacher questionnaire	6th grade teachers, 1974-75	Methods of reading instruction; emphasis on test-taking skills; training received; resources, aides, parent involvement; support from staff, specialists, principal; problems encountered; results of reading program
Checklist for 6th graders	6th grade teachers, 1974-75	Special services received; parent contact; motivation

- 5th grade Spring reading test score (CTBS-Q2 or R2)
- 6th grade Spring reading test score (CTBS-Q2)
- 6th grade Spring math test score (CTBS-Q2) (Class of 1975 only)
- 6th grade Spring reading test score (CTBS-S2) (Class of 1975 only)
- Date of continuous enrollment in sample school
- 6th grade teacher's name
- Days absent, 4th, 5th, and 6th grades
- Names of two 6th grade reading textbooks (Class of 1975 only)
- Number of reading textbooks listed (Class of 1975 only)

Information on the junior high school cumulative record folders was used only where photographs were needed for ethnic identification or for clarification of information on the elementary folder.

Two teams of specially trained coders recorded the information. They worked at the junior high schools under arrangements made with the principal, head counselor, and credit clerk. The coders searched the 7th and 8th grade files for records of graduates of any one of the 20 schools. Because the junior high schools organize their cumulative record files in various ways, the teams checked any special files (Title I, Mentally Gifted Minors, English as a Second Language, Educable Mentally Retarded) and inactive files so as to locate all types of students from each of the sample schools.

Table A.8

Elementary Cumulative Records Found by Junior High School, Class of 1974

Elementary School	Adams	Audubon	Belvedere	Berendo	Bethune	Carver	Clay	Drew	Edison	El Sereno	Foshay	Fulton	Gompers	Griffiths	Harte	Hollenbeck	Hughes
Alta Loma	1	5		4	1		1		1	1	2						
Angeles Mesa	4	26					1				1						
Ascot Avenue	6	1				68			8		2						
Dacotah Street										1				1		28	
Eastman Avenue			4	1						1				6		2	
Ford Blvd.			3							1				83		1	
Harrison			37							21				3		3	
Hillside																1	
Manhattan Pl.		6			1	1	13		1		2		1		21		21
McKinley					13		1	37	40		1						
Miller[a]	2				66	1	5		1		3		2		7		
118th							3	1	1				52		1		
112th					1		2		1				13		3		
Pacoima		2				1	1							1			
Rosemont			1	3											1		
Rowan			5											5	6		
Sierra Park										139					1		
10th				87											1		
28th	63	1		1	1	12			2	1	2						
Vermont	12			39	3			1	1	1	40				2	1	
Total	88	41	50	135	85	83	27	39	56	166	53	0	69	99	34	45	21

[a]The junior high school was omitted on one case from Miller Avenue; the case is not included in this table.

Table A.8 (CONTINUED)

Elementary School	Junior High School															Total
	King	Maclay	Mann	Markham	Mt. Vernon	Muir	Nightingale	Pacoima	Pasteur	Reed	Revere	San Fernando	Stevenson	Virgil	Webster	
Alta Loma			1		48	2			12		2			1		82
Angeles Mesa			19		1	3			1		31				16	104
Ascot Avenue			2	1		2										90
Dacotah Street													49			80
Eastman Avenue													132	1		146
Ford Blvd.													21			109
Harrison							1						1			66
Hillside							57									58
Manhattan Pl.			22	1		2			1							92
McKinley			1			1			1							95
Miller			6		1	17					1					112
118th				2												60
112th				56												76
Pacoima		82			1							33				121
Rosemont														83		88
Rowan													130			146
Sierra Park														1		141
10th										4			1	23		116
28th			1		2	2	5									93
Vermont			1	1	6	2			1							110
Total	0	82	53	61	59	31	63	0	16	4	34	33	333	109	16	1985

Table A.9

Elementary Cumulative Records Found by Junior High School, Class of 1975

Elementary School	Junior High School																
	Adams	Audubon	Belvedere	Berendo	Bethune	Carver	Clay	Drew	Edison	El Sereno	Foshay	Fulton	Gompers	Griffiths	Harte	Hollenbeck	Hughes
Alta Loma		8		3	1		1		1		1				2		
Angeles Mesa	1	33					1				1						
Ascot Avenue	3	1				84			2								
Dacotah Street																37	
Eastman Avenue[a]			1							1				2			
Ford Blvd.			2											59		1	
Harrison			46							17				1		1	
Hillside																	
Manhattan Pl.					1		18	1				10			19		30
McKinley					5			28	33		2		1		2		
Miller	1	1			55		1	1					1		7		
118th							3		1				67				
112th					1			1					15		2		
Pacoima										1							
Rosemont				3													
Rowan			4							1				1		4	
Sierra Park										145							
10th				94												1	
28th	82			1		7		1								1	
Vermont	3	3		52			1				32						
Total	90	46	53	153	63	91	25	32	37	165	36	10	84	63	32	45	30

[a]The junior high school was omitted on one case from Eastman Avenue; the case is not included in this table.

Table A.9 (CONTINUED)

Elementary School	Junior High School															Total
	King	Maclay	Mann	Markham	Mt. Vernon	Muir	Nightingale	Pacoima	Pasteur	Reed	Revere	San Fernando	Stevenson	Virgil	Webster	
Alta Loma		1			49	1			18		2					88
Angeles Mesa			12		1						18				22	89
Ascot Avenue					1	1								1		93
Dacotah Street													39			76
Eastman Avenue													147			151
Ford Blvd.													13			75
Harrison																65
Hillside							61									61
Manhattan Pl.			38			1			1							119
McKinley						1										72
Miller			1			16			2		2					88
118th																71
112th				52												71
Pacoima		92						26				34		1		154
Rosemont	8													92		103
Rowan													136			146
Sierra Park																145
10th	2									7			1	20		125
28th					2				1							95
Vermont				1	6				4							102
Total	10	93	51	53	59	20	61	26	26	7	22	34	336	114	22	1989

Test score data for the Class of 1975 from the sample schools were also obtained for 4th, 5th, and 6th grades using computer-printed test scores for students by school. To acquire information on the 6th grade test results for each school, and to compute changes for each school, it was necessary to do a hand match of the computer records with the information coded from the cumulative records. (Test scores for each grade were not on the cumulative record files for each year for each school.) For grades 4 and 5, these printouts were obtained from the Title I Research and Evaluation Office, and for grade 6 from the Research and Evaluation Office of the District. These printouts were matched by name and birthdate to information collected on the cumulative record coding form. The name was not included in any computerized records created at Rand, so this matching was carried out by clerks on the individual records. Added to the basic data records were 540 grade 4 scores, 399 grade 5 scores, and 205 grade 6 scores.

Representativeness of the Sample

To ascertain whether the sample of students for whom we found cumulative records is representative of all students who took the 6th grade reading test (CTBS-Q2), we made a comparison of test results for the graduating Class of 1975. This comparison was made possible by hand-matching the 6th grade computer printout of the CTBS-Q2 results to the data recorded from the cumulative record folders, to ensure there was complete information on the 6th grade scores.

The sample of the Class of 1975 included 76 percent of all test-takers in the 20 schools. The mean raw score on the CTBS-Q2 was 54 for both the sample *and* all test-takers. At the school level, nine of the schools had exactly the same mean raw score in the sample and for all test-takers. In eight schools the difference was only 1 between the mean raw scores of the sample and all test-takers. In two schools (Dacotah Street and Pacoima) the difference in mean raw scores was 2, and in one school (118th Street) the difference was 3. Thus we have strong evidence that the students for whom it was possible to build longitudinal records of test-score results constituted a representative sample of all test-takers in the student population.

Collection of Data on School and Classroom Factors

We conducted two kinds of studies in our 20 schools. We wanted, first, to get a full picture of how reading programs fit into the larger world of the school. Second, we wanted to conduct a comprehensive survey of reading instruction at each of the schools. We began by studying three schools in detail, to ascertain the kinds of differences among reading programs that should merit our attention in all of the sample schools. We also tried to discover how schools act as the *setting* for a reading program—for example, how special programs such as Title I affect reading, how a new math curriculum might consume more teacher time and therefore affect reading, or how the school's planning and problem-solving procedures are applied to the reading program. We accomplished this by means of personal interviews with school people.

The other phase of our work in the 20 schools largely consisted of the administration of a series of questionnaires. Using the information and understanding we gained in the three detailed studies, we constructed a group of interview forms and questionnaires to enable us to gather quantifiable information that would be compa-

rable across all the schools in our sample. We interviewed several staff members at each school, because we believe that people with different roles in the reading program—teachers as compared with principals, for instance—have different insights into how it worked.

We received remarkably full cooperation from the administration, staff, and faculty of all 20 schools. *All* principals and *all* reading coordinators agreed to be interviewed or completed questionnaires. Of the 83 teachers who were responsible for 6th grade classes in 1974 and 1975, 81 completed questionnaires, even though many were teaching in other schools by the time we traced them, and one was teaching in another state. Our access to school personnel and records was consistently facilitated.

Appendix B

SIXTH GRADE READING ACHIEVEMENT AS A FUNCTION OF INITIAL ACHIEVEMENT AND BACKGROUND

Variable	Black Children	Mexican American Children
Fifth grade score	.74 (15.32)	.74 (21.90)
Male	-.66 (- .51)	1.41 (1.56)
Days absent	-.19 (-2.98)	-.03 (-.91)
Health factors cited	2.98 (1.85)	-.52 (-.53)
Family: mother, father	-.56 (- .18)	-1.65 (-.84)
mother only	.43 (.14)	-.75 (-.34)
guardians	-2.87 (-.68)	.26 (.07)
Father: professional, technical	-5.78 (-1.38)	5.03 (1.39)
white collar	-7.83 (-2.07)	.32 (.10)
craft worker	-4.41 (-1.26)	.66 (.35)
operative	-10.26 (-2.94)	.02 (.01)
laborer	-6.69 (-2.12)	1.45 (.73)
service worker	-5.84 (-1.78)	-.33 (-.14)
occupation blank	-4.84 (-1.67)	.33 (.18)
Mother: white collar	-2.40 (-.64)	3.05 (.90)
service worker	-4.27 (-1.15)	1.92 (.66)
operative	1.66 (.40)	-3.74 (-1.58)
housewife	-1.06 (-.33)	-.41 (.21)
occupation blank	-.58 (-.18)	-1.60 (-.73)
Age in months	-.31 (-2.21)	-.16 (-1.79)
Remedial reading pullout	-10.21 (-5.28)	-3.13 (-1.85)
Gifted program pullout	2.08 (.58)	1.61 (1.03)
Constant	81.13 (3.81)	50.33 (3.62)
R^2	.581	.675
Number of observations	356	394

NOTES: Entries are regression coefficients, with t-statistics in parentheses.

Excludes observations obtained from classrooms in which test exposure was reported or indicated by field research.

Because of the varying quality of some of the background data, and because of the substantial multicollinearity in the sample, it is unwise to interpret the size and direction of individual coefficients. These regression equations are simply designed to control for as much of the pre-6th-grade background of each child as possible; no further inference is intended.

Appendix C

VARIABLES IN REGRESSION ANALYSIS OF READING ACHIEVEMENT FOR BLACK CHILDREN

I. BACKGROUND VARIABLES

6TH GRADE SCORE. Raw score on CTBS-Q2, given May 1975.

5TH GRADE SCORE. Raw score on CTBS-R2, given May 1974.

SEX. Dummy variable for male student.

ATTENDANCE. Days absent during 1974-75.

HEALTH PROBLEMS. Dummy variable for whether any "significant health factors" were noted on child's record.

FAMILY STATUS. Dummy variables for mother and father present; mother only present; guardians present, from child's record.

FATHER'S OCCUPATION. Dummy variables for selected occupations: professional, technical, and kindred worker; white-collar worker; craft worker; operative; laborer; service worker; father's occupation missing.

MOTHER'S OCCUPATION. Dummy variables for selected occupations: white-collar worker; operative; service worker; housewife; mother's occupation missing.

AGE. Age in months.

REMEDIAL READING. Dummy variable for whether child was "pulled out" of regular classroom for supplementary instruction in reading by a teacher other than the regular teacher.

GIFTED PROGRAM. Dummy variable for whether child was "pulled out" of the regular program to participate in special activities for gifted children.

II. CLASSROOM VARIABLES (REPRODUCED FROM THE TEACHER QUESTIONNAIRE)

DISRUPTIONS. In a typical *month* last year, how often did you have severe disruptions (fights, loud or boisterous play, vandalism) in your classroom?

Never	1
Once or twice	2
3—5 times	3
6—10 times	4
More than 10 times	5

NUMBER OF PARENT VISITS. About how many of your students' parents came into the classroom for a visit last year?

SENSE OF EFFICACY. Product of:

Please indicate whether you agree or disagree with each of the following statements about this district, this school, and about teaching.

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
When it comes right down to it, a teacher really can't do much—most of a student's motivation and performance depends on his or her home environment	1	2	3	4	5
If I try really hard, I can get through to even the most difficult or unmotivated students	5	4	3	2	1

VARIETY OF MATERIALS, WITH AMOUNT OF TRAINING. Linear combination of:

Please indicate the extent to which your school's reading program affected the following aspects of your teaching practices.

Your use of a greater variety of materials for different children at any one time:

7 6 5 4 3 2 1

Great impact — No impact

About how many hours of training sessions (lectures or workshops) did you attend *before* you began implementing the reading program in your classroom?

None 1
6 or fewer hours (consider 6 hours one work day) 2
7 to 18 hours (consider 18 hours three work days) 3
19 to 30 hours (consider 30 hours one work week) 4
More than 30 hours 5

TEACHER ADAPTATION OF PROGRAM. Product of:

To what extent were teachers encouraged to adapt or modify the reading program on an individual classroom basis?

7 6 5 4 3 2 1

To a great extent — Not at all

Please indicate whether you agree or disagree with each of the following statments about this district, this school, and about teaching.

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
A teacher's reading instructions was expected to conform closely to the school's reading program guidelines; making one's own modifications in reading instruction was discouraged	1	2	3	4	5

TEACHER-TO-TEACHER CONSULTATIONS.

How much did you consult with other teachers on an informal basis about the reading program and your work with it?